

“Guidelines and Best Practices for MSMEs to assure resiliency and progress towards a circular economy in sustainable resource management and critical raw material supply chain solutions in Serbia”



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Executive Summary

The Economic Commission for Europe (ECE) is one of the major partners involved in the implementation of the UNDA project "Global Initiative towards the post-COVID-19 resurgence of the MSME sector" to strengthen the capacity and resilience of micro, small and medium-sized enterprises (MSMEs) in developing countries and economies in transition. The implementation of the project should enhance economic and social development and mitigate the negative impact of the global Covid-19 pandemic crisis. Part of the project implemented by the ECE should help MSMEs and the member States to use effectively developed guidelines and best business practices to ensure CRM supply chain resilience and progress towards a circular economy, in a sustainable resource management system and in competitive solutions in the supply chain of critical raw materials.

It can be expected that the role of MSMEs in ensuring the supply of critical raw materials in the post-COVID-19 recovery phase will become very important, even crucial. During the first phase of the project, the ECE has developed guidelines and best business practices for MSMEs to ensure resilience and progress towards a circular economy in sustainable resource management and find solutions in the supply chain of critical raw materials. The received report is focused on possibilities and challenges for MSMEs involved in the crucial raw materials supply as an essential response to the COVID-19 pandemic and post-pandemic economic recovery.

In the project's second phase, tailor-made Guidelines and best practices were developed for two pilot projects, i.e. for Tajikistan and Ukraine. In the third phase of this project, the Guidelines are being implemented in four additional countries, including Serbia.

The main task of this phase of the project is to develop a study based on which the online training for all stakeholders will be carried out. It is expected that the subject study, in business development, will help entrepreneurs, managers, technical experts (in already existing and potential MSMEs), financiers, civil servants as well as policy makers in Serbia to understand challenges and available opportunities as regards COVID -19-related issues in the supply chain of critical raw materials.

The study resulted in the following recommendations:

1. Access to information and education
2. Digitalization in business
3. Linking the MSMEs within individual sectors
4. Introduce Circular Economy principles in their production processes to optimize operational costs
5. Policy of the development of strategic documents
6. Implementation of UNFC and UNRMS
7. Data digitalization
8. Harmonisation of legal rules related to the supply chain (mineral raw materials)
9. Financial support for MSMEs

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The List of Abbreviations

UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Program
UNFC-2019	United Nations Framework Classification 2019 Update
UNRMS	United Nations Resource Management System
EU	European Union
CRM	Critical raw materials
RS	Republic of Serbia
NBS	National Bank of Serbia
GDP	Gross domestic product
RSD	Republic of Serbia Dinar
€	Euro
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
JORC code	Australasian Joint Ore Reserves Committee- Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
NI 43-101	National instrument for the Standards of Disclosure for Mineral Projects within Canada
PERC	Pan European Code for Reporting of Exploration Results
MSMEs	Micro, small and medium enterprises
BRA	Business Registers Agency
PPO	Public Procurement Office

Introduction;

In Serbia, the first case of COVID-19 was reported on 6 March 2020. The state of emergency was declared in Serbia on 15 March 2020, and the pandemic of the Coronavirus disease was announced on 19 March 2020. The first fatality from the disease was reported on 20 March 2020. The Ministry of Health of the Republic of Serbia set up a website, where all data related to the Coronavirus pandemic on the territory of Serbia is updated daily at 15:00. In that respect, it is essential to point out that from the outset of 2021, the citizens of the Republic of Serbia have the choice to get vaccinated against COVID-19 with vaccines from four different manufacturers (Pfizer-BioNTech, Sputnik V, Sinopharm, Oxford/AstraZeneca, and Moderna is newly available). A website has been set up where COVID-19 vaccination data are published. At this point in time, around 42 % of citizens of Serbia are fully vaccinated. Foreign citizens were also allowed to get immunised in Serbia with and without residence. Approximately 175,000 individuals took advantage of the opportunity.

The study “Guidelines and Best Practices for MSMEs to assure resilience and progress towards a circular economy in sustainable resource management and critical raw material supply chain solutions in Serbia” was made in the September-November 2021 period, according to Agreement No. 2500275827 (UNECE). The report was drawn up using publicly accessible data only. Particular emphasis was placed on an overview of Serbia's CRM primary and secondary sources, supply and demand. As regards the current situation, excavation - extraction and processing of metal ores, critical mineral raw materials (CRM) included in the EU list (published in 2020) have been elaborated.

The Strategic document signed by Serbia and UN in 2017 clearly presents the possibility for implementation of the UNFC and then of UNRMS systems, i.e. global (voluntary) classification for resources and resource management systems (energy, water, land and other resources) in existing legislation and in the mineral raw material sector in Serbia. It is noted that there is currently a *self-developed conversion map* of harmonised geological data on mineral raw materials and reserves quantities in Serbia within the UNFC-2009 system and that new legislation in the area of geological exploration and mining has identified a method of classification and reporting of mineral resources and reserves according to the Pan European Reporting Standard (PERC).

Taking into account the importance and role of MSMEs for the economic development of Serbia and economic growth, the said report addresses legislation regulating operations of MSMEs, their access to information, market access, access to finance, technical and technological innovations, the supply chain etc.

According to the Law on Accounting ("RS Official Gazette", 73/2019 and 44/2021 - other law), legal persons and sole proprietors in the Republic of Serbia are classified into micro, small, medium-sized and large-scale legal entities depending on the average number of employees and operating income during the financial year, as well as the value of total assets determined on the date of preparation of the regular annual financial statement.

According to a report published by the Business Registers Agency (BRA), in 2020, 105,689 of all registered companies (106,111) in the Republic of Serbia were MSMEs (with a total of 826,397 employees).

The report suggested that annual reports on the MSMEs' state of affairs do not provide data on women's entrepreneurship, so there is no data on how enterprises operate concerning the owners' gender. There is no publicly available progress report on implementing the MSMEs Strategy related to women's entrepreneurship.

Following the epidemic declaration in the Republic of Serbia, the Government and the National Bank of Serbia (NBS) have put in place an economic package to reduce the negative effects caused by the COVID-19 pandemic and support the economy of Serbia. The package included nine measures, with an estimated impact of 608.3 billion dinars (5.1 billion euros).

The Republic of Serbia, due to its structural-geological-metallogenic position and zoning in Southeast Europe, i.e. in the Balkans, is a country rich in a wide variety of mineral raw materials, with a long history of mining, especially of non-ferrous metals and precious metals. The ongoing geological exploration activities in the country and the expected opening of several new mines offer an excellent opportunity for MSMEs development and their involvement in the production and supply chain.

At present, intensive geological exploration activities are underway in Serbia, mainly of all types of metals and industrial minerals (Cu, Au, Pb, Zn, Ag, Mo, Sb, Sr, Li, K), and the copper and gold mine Čukaru Peki was recently opened, which is essential for the MSMEs development in the supply chain of critical raw materials, since Ge, Ga, In, Pl, the rare heavy earth and the light rare earth are extracted as a by-product derived from the exploitation and processing of copper ore. Geological exploration for boron and lithium at the Jadar deposit in the Jadar Neogene basin was completed. Balance reserves of boron and lithium from the mineral jadarite, which constitute the primary source of highly demanded critical mineral raw materials included in the EU CRM list 2020, are verified. Moreover, documentation to open the mine is currently being prepared.

Several recommendations, i.e. measures and policies to be adopted to improve the operations of MSMEs in the domain of CRM in Serbia, arose from studies and reflections on the role of MSMEs in the supply chain of critical raw materials, in the context of the COVID-19 pandemic and in the expected post-pandemic economic recovery. The study resulted in the following recommendations:

1. Access to information and education
2. Digitalization in business
3. Linking the MSMEs within individual sectors
4. Introduce CE principles in their production processes to optimize operational costs
5. Policy of the development of strategic documents
6. Implementation of UNFC and UNRMS
7. Data digitalization
8. Harmonisation of legal rules related to the supply chain (mineral raw materials)
9. Financial support for MSMEs

The present Report under this project, focusing on MSMEs and the supply chain of critical raw materials in Serbia, has been made in Belgrade in the September-November 2021 period, in "changing" conditions of infection levels and adverse impacts of the COVID-19 pandemic. The study author is Ms Ana Dajovic, an Economic Geologist independent consultant.

1. Background:

1. COVID-19 and the impact on micro-, small and medium enterprises (MSMEs) in Serbia

The appearance of the pandemic caused by the COVID-19 virus has had hurts the public health of all countries, consequently affecting both developed markets and developing economies, to which the need of the Republic of Serbia belongs.

In this sense, in the Republic of Serbia, micro, small and medium enterprises (MSMEs) are most affected, which is very important for its economy because MSMEs represent over 99% of active companies. These companies generate over 30% of GDP, contributing 40% to total exports and providing employment opportunities in the country, with over 67%.

All these elements indicate that the key to the recovery of the Serbian economy, after the pandemic caused by the COVID-19 virus, is actually in the recovery of the MSME sector, which lost about a third of its revenues which is financed mainly from external sources.

In the Republic of Serbia, according to the report of the Business Registers Agency (BRA), in 2020, 106,111 of all registered companies employed a total of 1,217,954 workers, which is 3.7% more than in 2019. Of that number, 105,689 companies belong to MSMEs and employ 826,397 workers. The number of 289,355 independent entrepreneurs (registered business entities) should be added here. In 2020, the number of companies without employees was reduced by 3.1% (according to the BRA), but these companies (31,465) account for 29.7% of the total number of companies in Serbia.

It should be emphasized that these MSME companies, in addition to direct employment, have a much broader social impact on the quality of life of over 3 million people in our country (employee families, small suppliers, etc.) or about 40-45% of the total population of Serbia. In addition, many of these companies operate in economically underdeveloped – less developed municipalities and local communities where they represent significant economic support for generating income at the local level.

Figure 1 – Overview of companies in Serbia, according to size 2018-2020 (BRA)

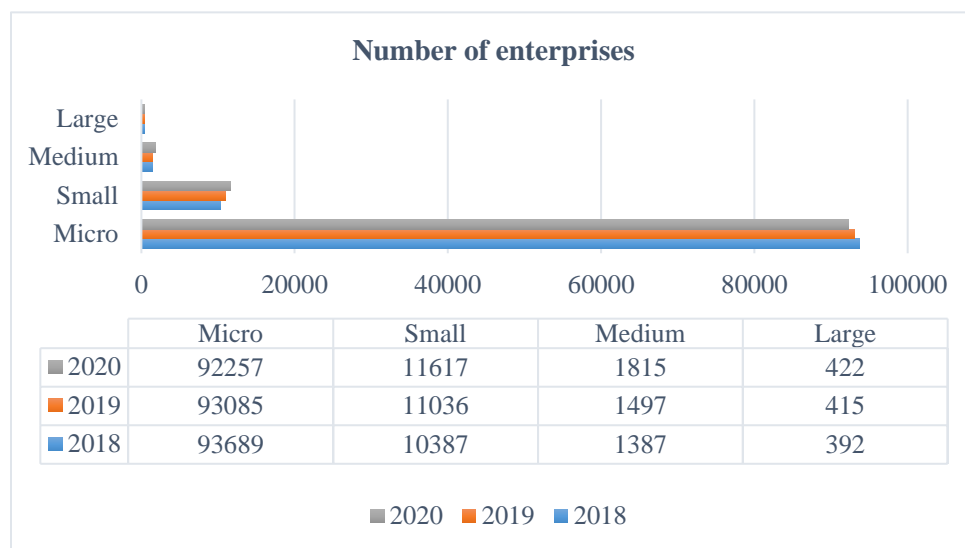
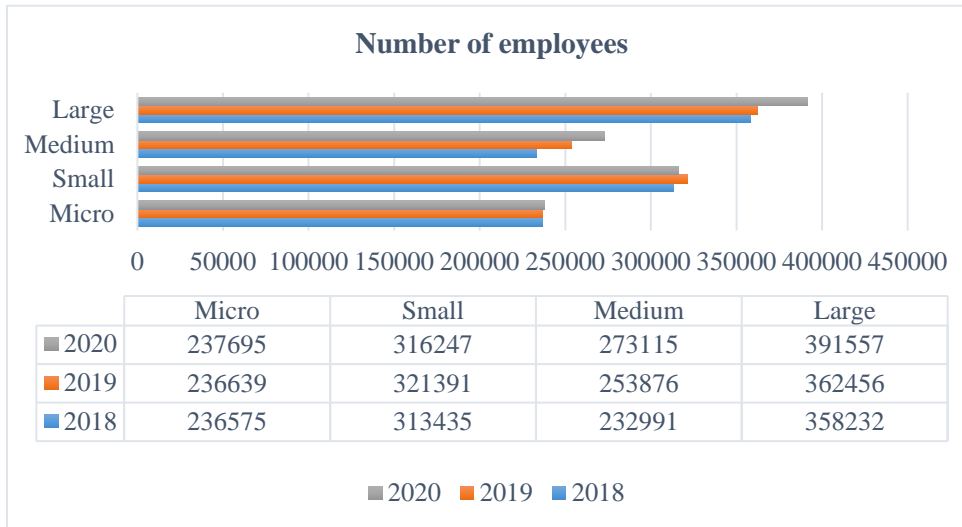


Figure 2 – Overview of companies in Serbia, according to number of employees, 2018-2020 (BRA)



Annual reports on the MSMEs’ state of affairs do not provide data on women's entrepreneurship, so no data on how companies operate concerning the owners’ gender. There is no publicly available progress report on implementing the MSME Strategy related to women's entrepreneurship. The 2021-2030 National Strategy for Gender Equality, with its 2021-2023 implementation action plan, which was recently adopted by the Government of the Republic of Serbia, states that there are still no systematic gender statistics on women's entrepreneurship. Some progress has been made due to the Gender Responsive Budgeting process in the Statistical Office of the Republic of Serbia, with the introduction of new gender indicators in business statistics. Progress has also been made with the Public Procurement Office (PPO), which, in 2020, has started monitoring the participation of women-owned companies in the total number of concluded contracts or framework agreements through public procurement procedures on an annual basis. In the Performance Report for 2020, the PPO states that this percentage was 23%, 8% higher than the estimate. At the moment, the most reliable assessment of women's participation in business, that of 31.7%, is presented in the survey on the position of women in the business sector in Serbia (Babovic, 2014), which distinguishes women's participation in companies (24%) and among registered entrepreneurs - sole proprietors (32%).

The Government of the Republic of Serbia officially introduced Gender Responsive Budgeting in 2015, with the adoption of the Budget System Law, when the promotion of gender equality was recognized as one of the budget goals. Within the GRB, the Republic Geodetic Authority (RGA) has improved the gender statistics of its real estate records. Based on available data, in 2019, 25% of real estate was exclusively owned by women, 65% was owned solely by men, and 10% was in joint ownership. In its Budget Performance Report, the Ministry of Economy stated that in 2020, 375 business entities were provided support for starting a business, of which 142 or 37% were women.

When it comes to data on the participation of women in the ownership structure of corporate entities registered in 2020 in the infographic available on the Serbian Business Registers Agency’s website, 33% of sole proprietors are women, among single-member companies, 16.3% of owners are women, 25.2% of multi-member companies’ owners are women and 22.6% women hold the position of legal representatives or directors.

After declaring the epidemic in the Republic of Serbia, the Government and the National Bank of Serbia (NBS) reacted quickly. They adopted a package of economic measures to reduce the adverse effects caused by the COVID-19 pandemic and provide support to the Serbian economy, which included nine steps, with an estimated impact of 608.3 billion dinars (5.1 billion euros).

Basically, economic measures were divided into tax policy measures, direct assistance to the private sector, measures to preserve liquidity, and immediate financial assistance to all adult citizens. These are comprehensive measures whose primary goal is to maintain the acquired level of employment and help companies that are most affected by the crisis caused by the coronavirus epidemic (primarily from the service sector) [33]

The four groups of economic measures in question include:

- Tax policy measures (deferral of payment of taxes on salaries and incomes for the private sector (during the state of emergency), with subsequent repayment of incurred liabilities in instalments (starting at the earliest from 2021), deferral of payment of income tax in the second quarter of 2020 and exemption of donors from the obligation to pay VAT),
- Direct assistance to the private sector (payment of aid in the amount of 3 minimum wages to entrepreneurs who are taxed at a flat rate and pay real income tax, as well as micro, small and medium enterprises (MSMEs) in the private sector, and payment of aid to large companies in the private sector in the amount of 50% of the net minimum wage for employees who received the decision on the termination of work),
- Measures to preserve liquidity (financial support to the economy through the Development Fund of the Republic of Serbia and a guarantee scheme to support the economy) and
- Other measures (moratorium on the payment of dividends until the end of 2020, except for public companies, efforts to increase salaries and direct assistance to all adult citizens of Serbia of 100 euros in dinars).

The measures of the Government of RS and NBS that preceded this package included an increase in salaries in the health sector, for the medical workers, by 10% from April 1, 2020, then one-time assistance for pensioners for 4,000 dinars, a moratorium on loan repayment and reduction of reference interest rates by 0.5%, to the level of 1.75%.

In July and August, the additional package of measures included the payment of aid in the amount of 60% of the minimum wage to entrepreneurs, micro, small and medium enterprises, deferral of taxes and contributions for one month and direct support to the tourism and hotel sector – 350 € per bed, 150 € per room.

Total measures in 2020 amounted to about 13% of GDP in Serbia, and an additional package of steps in the amount of 4.3% in 2021 is envisaged, which includes four financial support programs by the Ministry of Economy to small and medium enterprises for which it has been allocated two billion dinars. This program is for the procurement of equipment, encouraging entrepreneurship through development projects, support programs for starting businesses and a program for young and women entrepreneurs.

The Program for Encouraging the Development of Entrepreneurship through Financial Support for Women Entrepreneurs and Youth in 2021, which is being implemented for the first time this year, has sparked great interest, as evidenced by the announcement of the Development Fund of RS. The information stated that from August 24, 2021, at 4 p.m., they are

suspending the receipt of new requests for grants due to the large number of received requests, which will, per current estimates, after processing, use up all intended contributions of the Ministry for the implementation of the Program in 2021.

In cooperation with the Ministry of Economics, the Center for Digital Transformation of the Serbian Chamber of Commerce invited companies to participate in the new "Digital Transformation Support Program for Micro, Small and Medium Enterprises 2021". Therefore, it is evident that the MSME sector will have the opportunity to improve its business with the help of certified consultants by introducing modern digital tools.

The published Map of the Register of Measures and Incentives for Regional Development, which presents information on state investments, economic development and economic potentials, with semi-annual data for 2021, shows that the implementers of regional development implemented significant incentives and that state support was primarily intended for the economy [28]. Total incentives in the first half of the current year were realized for 67.03 billion dinars, with 62.48 billion dinars, or 93.2%, related to grants.

In the *COVID-19 Socio-Economic Impact Assessment* report [36], the UN says that the UN's global response to the COVID-19 crisis is designed to support governments looking beyond the current recovery, keeping in mind the long-term development goals and the Agenda 2030. It can be identified in five broad areas of recovery: health system, social protection, jobs, economy (including green economy) and overall resilience.

In general, the impact of the pandemic crisis on workers varied depending on the type of work, the employment sector and the size of the company. Most affected were workers employed in smaller enterprises, those directly restricted by the movement ban, and those used in the informal economy. The crisis has proven that size matters – smaller companies have been hit hardest, but they have also adapted their business model or products to this new emergency more agilely. Also, the report states that instead of just recovering to pre-COVID-19 levels, Serbia has the opportunity for better further progress, which includes integrating elements of green recovery, increasing the resilience of the economy and society to future potential shocks improving welfare and equality among citizens.

Before the COVID-19 pandemic, Serbia's GDP grew by 4.4% in 2018 and by 4.2% in 2019, mainly under the influence of foreign direct investment (FDI) and domestic consumption. A similar growth rate was expected in 2020; however, the impact of the global pandemic crisis halted that growth. According to the NBS [33], no change was achieved, and the decline in GDP in 2020 was only 0.9%. All the accompanying events had minor economic consequences for Serbia compared to most European countries; due to the achieved macroeconomic and financial stability in the previous period, previous growth dynamics created fiscal space, timely and comprehensive package of measures, and the economy's structure. The economic return to the pre-crisis level was reached in the first quarter of 2021, while in the second quarter, the real GDP growth reached the level of 13.7%, which is above the Statistical Office of RS's flash estimate of 13.4%.

The critical statement from the previous review **on the impact of the COVID-19 pandemic on MSMEs in Serbia** can be found in the publication "Enterprises in Serbia and Agenda 2030 - Priorities, Challenges and COVID-19 Crisis", CEVES [50], the result of a survey of 1100 Serbian companies of different size, sector and region in which they are located, indicating that more than two-thirds of MSMEs discontinued their business operations due to COVID-19, that 20% of MSMEs had to restrict almost all functions and that 49% of additional MSMEs worked with

significantly reduced capacity and had a significant lack of resources and revenue. It was shown that medium-sized companies offered the most incredible resilience in the economy – they were "small enough" to be agile and adaptable but also had the capacity, structure and resources that were more similar to larger companies, which helped them attract funding. On the other hand, large companies had the ability, design, and resources. Still, they suffered the consequences because they were rigid and slow, inert and unable to adapt quickly to an environment that was changing rapidly at the beginning of the crisis.

2. Current status of MSMEs in critical raw material (CRM) value-chain in Serbia

According to the Law on Accounting [19], legal entities and entrepreneurs in the Republic of Serbia are classified into micro, small, medium and large legal entities, depending on the average number of employees and operating income in the business year and the value of total assets determined on the balance sheet date of the regular annual financial report.

Micro legal entities include those legal entities and entrepreneurs that do not exceed the limit values of two of the following three criteria at the balance sheet date:

- 1) an average number of employees is ten;
- 2) operating income of EUR 700,000 in dinar equivalent;
- 3) the value of total assets at the balance sheet date is EUR 350,000 in dinar equivalent.

Small legal entities are those legal entities and entrepreneurs that at the balance sheet date exceed the limit values of the two criteria for micro legal entities but do not exceed the limit values of two of the following three criteria:

- 1) an average number of employees is 50;
- 2) operating income of EUR 8,000,000 in dinar equivalent;
- 3) the value of total assets at the balance sheet date is EUR 4,000,000 in dinar equivalent.

Medium-sized legal entities are those legal entities and entrepreneurs that at the balance sheet date exceed the limit values of two criteria for small legal entities but do not exceed the limit values of two of the following three criteria:

- 1) an average number of employees is 250;
- 2) operating income of EUR 40.000.000 in dinar equivalent;
- 3) the value of total assets at the balance sheet date is EUR 20.000.000 in dinar equivalent.

Large legal entities include legal entities and entrepreneurs who exceed the limit values of the two criteria for medium-sized legal entities at the balance sheet date.

Since **in the Republic of Serbia, critical raw materials are not a criterion for classification in any form**, there is no statistical data, particularly on companies related to essential mineral raw materials and the supply chain.

Based on available data on MSME operations in Serbia, MSMEs participate in the supply chain of critical mineral raw materials in the field of geological research, mining, processing industry, trade, transport and related services. Within these activities, in the Republic of Serbia, there are about 20% of MSMEs connected to the supply chain of critical mineral resources.

Micro, small and medium enterprises (MSMEs), as the backbone of the Serbian economy, are particularly sensitive to the economic consequences of the COVID-19 pandemic. Returning to the

usual way of doing business in the period after the pandemic is not an option in an emergency, which is constantly present for climate and biodiversity. In that sense, the concept of green recovery appeared as a "sanative" result, with the goal of "progressing better". The transition to a "green economy" and the financing of economic and any other recovery from the consequences of COVID-19 is a significant challenge and an exceptional opportunity to change the current, unsustainable patterns of consumption of natural and other resources.

To identify the existing potentials, shortcomings, opportunities and needs that MSMEs have in achieving the goals and green investments, UNDP Serbia and the EU Delegation, in the period from September 2020 to February 2021, conducted qualitative and quantitative research in cooperation with MSMEs from Serbia, commercial banks and international financial institutions (IFIs).

The research results enabled the drafting of concrete measures for companies, the domestic financial sector, and policy makers to increase the sustainable financing of MSMEs in Serbia while supporting the economic recovery after COVID-19.

The results of various types of surveys, conducted in the previous period, showed that the most affected are SMEs operating in production, transport, logistics and tourism. The latest SME Competitiveness Report for 2020 [35] provides an assessment of the impact of the coronavirus pandemic on small businesses. The transition to a circular economy is central to the European Green Agreement. According to the Green Agreement, the European Commission has proposed a new European industrial strategy. The strategy focuses on three drivers that will transform the European industry, support small and medium-sized enterprises, and foster European sustainability and competitiveness: green transition, digital transition, and global competitiveness. Climate neutrality and the circular economy are two factors in the group of elements necessary to implement industry transition. Finally, the EU also provides special support to the Western Balkans region in addition to the above economic response measure.

As for Serbia, the report shows that the disruptions in the international supply chain caused by the COVID-19 pandemic are the largest in the machinery manufacturing sector and the plastic and rubber manufacturing sector, dominated by linear business models, which are very important in the Serbian economy (Tigar-Pirot). As for other parameters and elements of the CRM supply chain and MSMEs in Serbia, which are related to the mentioned sector of geological exploration, mining, processing industry, etc., it can be comfortably said that MSMEs in the supply chain were very sensitive, that they suffered significant pressures and losses, by adverse effects of the COVID-19 pandemic, in the overall economic activity in Serbia. This has a distinct impact on small geological companies that were forced to lay off workers suspend the processes of geological exploration of critical and other mineral raw materials, which basically reflected on the overall mining activity, industrial processing capacities, environmental protection, and additional environmental protection.

3. Opportunities for CRM supply MSMEs in economic recovery in Serbia

The Republic of Serbia, thanks to its structural-geological-metallogenic position in SE Europe, i.e. in the Balkans, is a country rich in various types of mineral raw materials and with a long tradition of mining primarily non-ferrous and precious metals. The current intensive geological exploration that is taking place in the country, as well as the opening of new mines, provide an excellent opportunity for the development of MSMEs and inclusion in the entire production and supply chain.

In October 2021, the copper and gold mine Čukaru Peki was opened, announced as the first green mine on the territory of Serbia and the first to meet all world environmental standards. It is one of the largest deposits of copper and gold in Europe and the world, where more than 2 billion ore reserves are expected, which amounts to about 16 million tons of cathode copper and about 500 tons of gold. With that production, Serbia should stand side by side with the first producers of copper and gold in Europe. With the new mine "Čukaru Peki" opening, Serbia is expected to return to the top European producers of copper and gold. Serbia will be the second-largest copper producer in Europe, after Poland, and when it comes to gold production, Serbia will be right behind Finland. Copper from Bor and lithium from Loznica (respectively, the second most crucial opening mine whose procedure is in progress) are the two most essential world components in the ecological, economic and energy transition, allowing Serbia to be a leader in that field. The goal is for Serbia to be an exporter of raw materials and develop the entire production chain, including electric batteries and electric cars. [30]

All these activities related to the opening of new mines in Serbia are essential for the development of MSMEs in the CRM supply chain, knowing that Ge, Ga, In, Pl, rare heavy earth (It, Tb) and rare light earth (Sc, Ce, Nd) are obtained as a by-product of exploitation and processing of copper ore. Lithium ore and boron-jadarite ore (jadarite) in the Jadar deposit near Loznica is the primary source of highly sought-after critical mineral raw materials on the EU CRM list from 2020. In addition, the role and importance of MSMEs, in this case, is visible in future activities related to secondary sources of critical mineral raw materials (mining, industrial, construction waste, etc.), in terms of providing an adequate supply chain for these raw materials, not only for Serbia but also for broader requirements and needs.

For example, efforts to recycle secondary CRM sources mainly concentrate on metals that occur in large quantities and are easier to recycle, such as iron, aluminium, and copper. Regulatory targets in the EU are based on weight and volume, so current recyclers have little incentive to ask for small quantities of, e.g. rare metals, despite their value. The situation is similar in Serbia. Namely, although technogenic mineral raw materials are recognized as a concept in the legislation, and the possibility of their separation and valorization is given, there is no obligation of the holder of the exploitation permit from primary sources to introduce secondary sources into the recycling system to provide new quantities of CRM. The regulation of this area is based on a strategic document [20, 21], where the innovation of legislation and introduction of specific incentives by the state would significantly contribute not only to increasing reserves (quantities) of specific CRMs in Serbia but also the opening of many business and economic opportunities for MSMEs.

For example, EU countries have clearly defined that critical mineral raw materials are essential for their economic development (2020 list), i.e. their economies are dependent on imports of necessary mineral raw materials. The dependence of imports of critical mineral raw materials arises due to

the lack of that mineral raw material in EU countries, i.e. the lack of mineral deposits, and increasingly due to economic, environmental, strategic, geopolitical and social constraints and supply risks in the process of mineral exploration and exploitation. In that sense, the International Energy Agency (IEA) has calculated that if the world reaches zero greenhouse gas emissions in 2050, the demand for critical and rare minerals will be six times higher by 2040 than today. It is estimated that the demand for lithium alone will be 20 times higher than in 2040 due to its use in batteries.

UNIDO 2020 [37] pointed out the importance of looking at the manufacturing industry in the circular economy context. The main goal of this approach is to reduce the consumption of natural resources and, accordingly, waste generation. The purpose of circular manufacturing is to renew and reuse products, components, and materials by applying repair, reuse, refurbishment, remanufacturing, reduction, and replacement strategies. Materials are recycled or used only if absolutely necessary as an energy source. In addition, circular production emphasizes industrial, energy efficiency, and renewable energy sources.

2. Progress towards sustainable resource management and the circular economy: Application of UNFC and UNRMS in Serbia; Brief overview of opportunities for MSMEs in critical raw material supply in Serbia:

Regarding the assessment of progress towards sustainable resource management and the circular economy model following the 2030 Agenda, the application of the UNFC and UNRMS systems, which have not yet been implemented in the mineral resource sector of Serbia, is inevitable for classification and resource management. The Republic of Serbia currently classifies the legally defined terms mineral resources and reserves of mineral raw materials according to the Rulebook on classifying and categorising reserves of solid mineral raw materials and keeping records on them from 1979, for ex-Yugoslavia (1979). This Rulebook categorizes reserves (quantity of mineral raw materials in situ, i.e. mineral resources) into A, B and C₁ and into potential reserves of C₂, D₁, D₂. Reserves A, B and C₁ (total; geological), by analysis of factors and indicators of technical and economic assessment (Modyfing factors), in the "Study on resources and reserves", are classified into the on-balance sheet and off-balance sheet reserves.

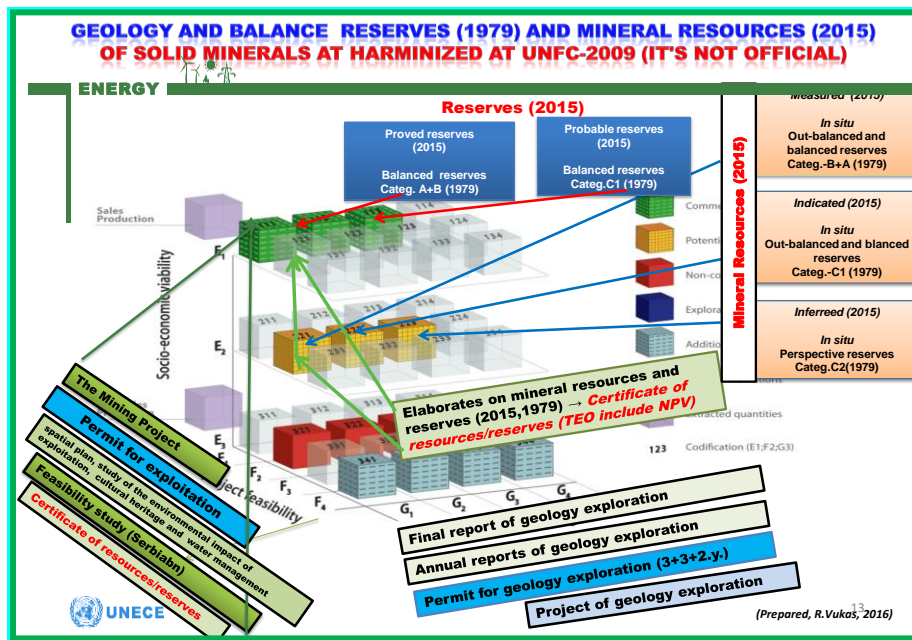
Amendments to the Law on Mining and Geological Exploration (2021) define the obligation to classify resources and reserves of solid mineral resources following the current version of the PERC. According to the above, the legislation in the field of classification and management of mineral (and other) resources currently applied in the Republic of Serbia does not recognize the application of UNFC or UNRMS. However, there are all predispositions for their application in Serbia, which is indicated by the previous efforts of Serbian experts who developed the conversion map (Figure 3) and who are actively involved in Serbia's cooperation with UNECE and EGRM and particularly emphasized attitudes of strategic support document on collaboration, which was signed between the Government of Serbia and the UN, in Belgrade in 2017.

It is important to note that in the Republic of Serbia in the last twenty to thirty years, there have been several attempts to harmonize data on geological, on-balance and off-balance reserves of mineral resources with the codes of the three-component UNFC system and thus implement it in the national reporting system. All this was done with the aim of a globally recognizable way of classification and then the method of managing the resources of the Republic of Serbia, which, however, was not realized. For that reason, today in the Republic of Serbia, in fact, only in professional circles and professional publications there is a self-developing conversion map, which has been developed and harmonized by a small number of authors.

Figure 3 – Proposed map of conversion [2, 3, 4, 10, 11, 12].

Proposed New Book of Regulations for Solid Mineral Raw Materials	Results of Geological Exploration	Mineral Resources			Mineral Reserves	
		Inferred	Indicated	Measured	Probable	Proved
Official Book of Regulations for Solid Mineral Raw Materials (1979)	Mineral Reserves					
	Potential	Potential	Established (in situ – Geological: Out-of-Balance and Balance)		Exploitation (inclusive of dilutions and losses during mining)	
	D ₂ , D ₁	C ₂	C ₁	B, A	C ₁	B, A
UNFC (2009)	334	223	Mineral Resources		Mineral Reserves	
			222	221	112	111

Figure 4 – The categories A, B, C₁, C₂, D₁ and D₂ in framework classification UNFC - 2009 [2, 3, 4, 10, 11, 12, 13]



This self-developed conversion map has been used for project evaluation and data processing on specific examples (coal deposits "Tamnava - West Field" in Kolubara basin and water resources of Zlatibor Mt.).

According to the harmonisation results, the UNFC has shown effectiveness in everything, especially in assessing the elements of the socio-economic axis and the feasibility axis, i.e. in the "parts" of the three-component system where a large number of MSMEs are positioned, especially during the Covid-19 pandemic. Some studies have shown that Covid-19 in the Republic of Serbia has the most significant impact on the E-axis and slightly less impact on the F-axis.

For all the above, there is now only an initially expressed will and need to harmonize the data on mineral resources/reserves of Serbia, with the framework UNFC system, and today with UNRMS. The initial conditions were recorded in earlier technical documents on cooperation (previously mentioned), which were harmonized in 2016 on behalf of the Ministry of Mining and Energy of the Republic of Serbia to cooperate with the UN in Serbia. It was also signed, through the new Development Partnership Framework between the Government of the Republic of Serbia and the United Nations Team for the period from 2016 to 2020 (UN-Serbia Development Partnership Framework for 2016-2020), where Pillar 4 expressed assistance to Serbia from by the UN, for the implementation of the UNFC system [41].

Under all the stated statements regarding the application of UNFC and UNRMS systems in Serbia, and from the aspect of achieving elasticity/durability/resilience of the current supply chain, i.e. the possibility for MSMEs in supplying critical raw materials using these systems, it is recommended that their application and implementation be incorporated into the subject legislative design of natural resources, i.e. into the sector of primary and secondary sources of mineral raw materials (CRM, etc.).

Considering the elements of the model of circular economy and sustainable development (Agenda 2030) in the Republic of Serbia, for MSME, which operates in the extractive industry and then in the supply chain of minerals and CRM, it is clear that it is possible to consider and evaluate appropriate mineral, mining, energy, water and other resources and projects using the relevant UNFC and UNRMS systems and their own convergence. It should be emphasized that the UNRMS system is designed as a unifying framework for integrated, indivisible resource management based on the UNFC system, which incorporates a unique methodological assessment of resources through a triple prism: (1) environmental-socio-economic sustainability, (2) technical feasibility and (3) confidence in assessments. In line with the above, the UNRMS system should be a voluntary global standard for sustainable integrated resource management, within: (1) public, (2) public-private partnership and (3) partnership with civil society, which is uniformly applied to all resources; and to include (1) building a unified resource management system, (2) integrated and indivisible natural resource management, (3) sustainable development goals and resource management, as well as (4) challenges in sustainable resource management, etc.

Considering the application of the UNFC and UNRMS systems in Serbia from the security of the supply chain and CRM was practically non-existent, especially from the aspect of considering their implementation during the current Covid-19 pandemic. The traditional way of using the supply chain and CRM, which lacks the UNFC and UNRMS systems, during the pandemic showed many weaknesses, such as unavailability of resources and CRM, changes in transport conditions of resource supply, changes in supply-demand conditions, significant impact on health sector of Serbia, on the business of MSME, etc.

Basically, access to minerals has always, and still is, the basis for technological progress, for a strong base in the global economy and is directly related to the industrial growth of countries. The EU economy is dependent on the import of mineral raw materials, especially on the importance of rare metals or critical mineral raw materials (CRM), with particular emphasis on those mineral raw materials that can meet the needs of new, environmentally friendly technologies that will save electricity for lighting, electric cars, fuel cells, etc. Therefore, following the built and projected diverse and sensitive industrial capacities, one of the main economic challenges for the EU, as well as for the Republic of Serbia, is import dependence, financial and strategic connection of supply risk, as well as the possibility of achieving a "green plan". For these reasons, the fact arises that the mineral raw materials sector of Serbia, i.e. the development of mining, based on the current situation and thus adequate classification and management of mineral raw materials, in the context of economic growth is not a matter of simple choice, but an inevitability.

The adoption of Resolution A/RES/70/1 Transforming our world: the 2030 Agenda for Sustainable Development of the UN in 2015 clearly set sustainable development goals, including the unique role of sustainable development: economic growth, social inclusion, and environmental protection. Basically, they are known as global goals representing a universal call to action to eradicate poverty, protect the environment, and ensure peace and prosperity. They clearly indicate that social needs are met by producing and using natural resources, from primary and secondary sources, and their production and use.

1. Primary and secondary resources of CRM

The vigorous development of technology and the impact of critical mineral raw materials on that development in modern technologies, lithium-ion batteries, wind generators, digitalization, etc., are becoming one of the main economic challenges in the EU and other European countries as in

Serbia. Increased imports of these raw materials from third countries, distance, dependence and the risk of supply disruptions have led the European Commission to review this list of critical mineral raw materials every three years, from an economic point of view and supply risk. In addition, the EU is on the path to developing a circular economy. The development of standards, standard requirements and guidelines for stakeholders in the field of circular economy is one of the best solutions for implementing a model of the circular economy. So far, there are no comprehensive guidelines standardized even for the countries of the European Union that would define the circular economy and the accompanying principles, strategies, implementation and monitoring. Only two European Union countries that have introduced national norms for the circular economy have been identified; formerly the United Kingdom with the BS 8001: 2017 circular economy standard and France with the XP X 30-901 standard, according to which the development of a comprehensive standard would accelerate the process of transition from a linear economy to a circular economy in each country. Security of supply of critical mineral resources is a crucial issue for economic development and the goals of the EU climate change policy, including the EU statement on the green agreement, adopted on December 11, 2019. The EU seeks to reduce the import dependence of raw materials critical to its industry by improving access to and use of already existing, primary resources and increasing the volume of recycling with a unique aspect on environmental protection.

The United States was the first country to establish a system for identifying critical minerals. The latest American report, Critical and Strategic Minerals - Society for Mining, Metallurgy & Exploration, was made considering the geopolitical risk of supply disruption, production growth rate, and market development. Critical and strategic minerals are seen as key to production and agricultural supply chains and the successful introduction of modern technologies in various industries, including telecommunications, national defence, and conventional and renewable energy.

Dependence on imports from China, Russia, and third countries determined the definition of "critical and strategic minerals". The number of 27 critical minerals has been determined, 20 of which are imported from China.

The primary focus for the supply of both minerals in general and critical minerals in Germany is defined by the Strategy for the Use of Minerals of the Republic of Germany in 2020, which looked at essential minerals from the risk of purchasing critical minerals, providing markets for crucial supplies and green economy from the aspect of using necessary raw materials for new, innovative technologies. The strategy is treated from the element of transformation into a circular economy, which is of particular interest because it is a crucial goal of the European Commission (European Commission, 2015; Maier et al., 2019)

In 2008, the European Commission launched the European Raw Materials Initiative, addressing growing concerns about the mineral supply dependence and subsequently updating the list of critical minerals every three years (2011, 2014, 2017, 2020).

Table 1: The fourth list of critical raw materials for the EU 2020 with highlighted minerals available in Serbia

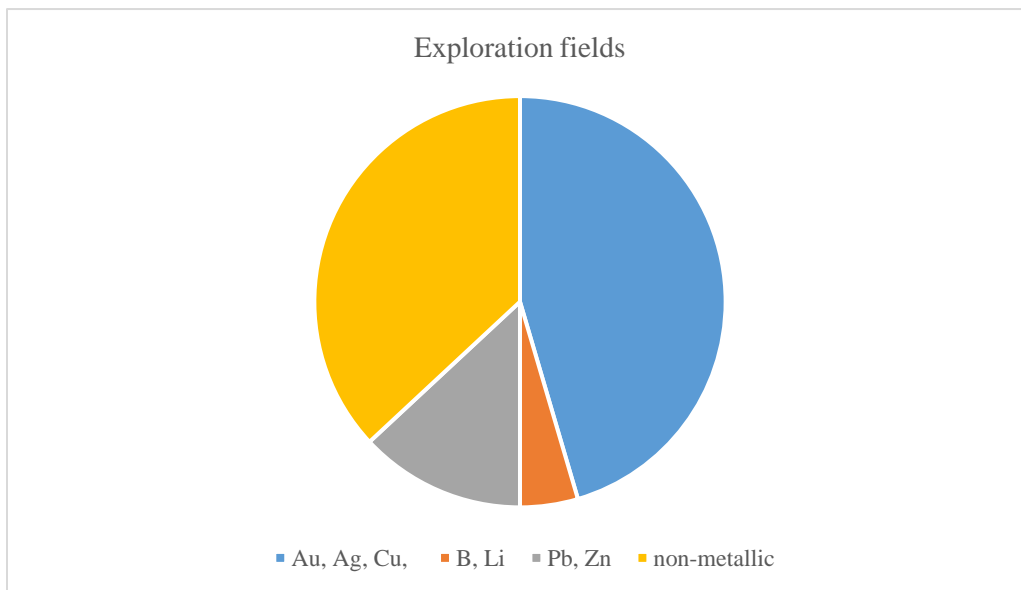
Antimony	Cobalt	HREEs	Natural Rubber	Silicon Metal
Baryte	Coking Coal	Indium	Niobium	Tantalum
Bauxite	Fluorspar	Lithium	PGMs	Titanium
Beryllium	Gallium	LREEs	Phosphate rock	Vanadium
Bismuth	Germanium	Magnesium	Phosphorus	Tungsten
Borates	Hafnium	Natural Graphite	Scandium	Strontium

The Republic of Serbia does not have a legal document to process critical mineral raw materials from a specific aspect (potential, economic significance, supply risk or level and type of industrial development). The Law on Mining and Geological Research (2021) defines mineral raw materials of strategic importance for the Republic of Serbia, namely: oil and natural gas, coal, copper and gold ores, lead and zinc ores, boron and lithium ores, oil clays, as and other mineral raw materials determined by a particular act of the Government (at the proposal of the ministry responsible for geological exploration and/or mining). In addition, it was emphasized that the applied geological research and exploitation of uranium, nickel and cobalt can be performed only with the prior consent of the Government of the Republic of Serbia (Co are on the EU CRM list from 2020).

As a country where the mining industry has been developed for centuries, with legislation that has been comprehensively improved, adapted and directed to achieve the most favourable investment environment for attracting foreign investment in market conditions, we can say that in recent years Serbia has become a regional leader area of SE Europe from the aspect of the development of geological research and mining, and especially geological research of ore phenomena and deposits of lithium and boron, copper and, gold, etc.

In the Republic of Serbia, geological exploration is currently being carried out on 176 research fields, of which 106 on the research of metallic mineral raw materials, 8 on the analysis of industrial minerals, boron and lithium.

Figure 5 – Exploration fields (MME)



Thanks to the discoveries of a new mineral (mineral B and Li, Jadarite) and its, in all unique and specific world-class deposits, a new copper and gold deposit, and for the first time in Serbia karline type gold deposits, as well as previously found but still inactivated mineral potential, in the Republic of Serbia there are more than good preconditions for the accelerated development of mining in the coming period, to increase the volume of CRM production, and ultimately to increase the share of mining production in Serbia's GDP.

In the Republic of Serbia, three large mineral projects (Jadar, Timok and Cukaru Peki) are currently being implemented in preparatory activities to exploit deposit/reserves of boron and lithium, i.e. copper and gold, and which significantly affect the work of MSMEs.

According to publicly available data (statistical, literary, internet, etc.), with this level of exploration of mineral resources, the Republic of Serbia has about 14 mineral resources included in the list of critical mineral resources of the EU in 2020. The following is an overview of raw materials from the list:

Antimony deposits belong to the hydrothermal type and are the most economically important. They are spatially connected to the terrains of western, central and southeastern Serbia. Geological reserves of Sb ore (quantities in situ; mineral resources) in the Republic of Serbia amount to about 4.198 Mt, of which balance reserves in the amount of 1.061 Mt, and off-balance reserves in the amount of 3.137 Mt. The total potential resources of Sb are estimated at about 6.2 Mt. Geological research is currently being carried out on a minimal scale in western Serbia. There is no active exploitation of antimony ore nor data on its import or export. Based on the overall data of geological research and earlier exploitation of antimony ore, it can be said that Serbia has a favourable geological-mining potential for the future, reactivation of the exploitation of this critical mineral raw material.

Barite deposits belong to the hydrothermal-wire and metasomatic type, and the most significant phenomena and deposits have been explored in western, central and southeastern Serbia. In the Bobija deposit in west Serbia, geological reserves were balanced, and the amounts of balance reserves of 1.2 Mt with 51% BaSO₄ were determined. Potential geological reserves are stated in the amount of 0.5 Mt. Today, only on the broader area of the Bobija deposit, geological research is being carried out in western Serbia, and mining production is active but on a minimal scale. No data are available on barite exports and imports. From the aspect of barite, there is potential in Serbia.

Beryllium - The appearance of beryllium, in terms of finding economic concentrations, is related to granodiorite rock masses and accompanying pegmatites. Beryllium occurrences (fine-grained beryl) have been ascertained and investigated in western, central and southern Serbia (Kukavica, Bukulja, Željin and Cer mountains). Currently, no geological surveys of beryllium or exploitation are being conducted, and there are no data on imports and exports.

Bismuth- is obtained as a by-product during active mining exploitation of lead and zinc reserves in the Rudnik deposit, near Gornji Milanovac, as well as within smaller Skarn deposits Pb, Zn, Bi, Cd, Cu, W. Bismuth ore occurrences are also known in the domain of Cer mountain granitoid, as in sediments of surrounding hydrocurrents, in association with Ni, Pb, Zn, and Ag. As a by-product in the exploitation of lead and zinc reserves, the production of Bi is continuous in the period COVID-19.

Borates - Geological reserves of borates in the Republic of Serbia amount to about 0.140 Mt, representing on-balance reserves in the Pobrđski Potok deposit within the coal deposit of the Ibar mines. Borates have been explored in more detail in Serbia's Jarandol, Kremnan and Jadar Neogene basins. The total "identified" reserves in the Jarandol basin (Piskanja and Pobrđski potok) are about 8.5 Mt with about 38% B₂O₃. The full potential of the Jarandol Basin is estimated at about 30 Mt with an average content of 36% B₂O₃. Jadar basin, i.e. boron and lithium deposit Jadar, in terms of quantity and quality, is one of the largest boron and lithium deposits in Europe, i.e. it is a class of world deposits. Currently, geological research of borates is being carried out in southwestern Serbia.

Cobalt (Co-Ni) - occurs in the Republic of Serbia in laterite deposits, progeny with nickel. The deposits stakes are grouped into several more minor ore, metallogenetic units. The most important are: the Drenica region in Kosovo i Metohija [56], the Kopaonik zone, the Šumadija zone and the Fruška Gora ore field. Other nickel deposits (ferronickel ores), which were formed in the lateralization of peridotite or serpentinite, are known in Serbia but have not been investigated in more detail. Also, mineral occurrences of Ni-Cu sulfide in peridotites (Zlatibor) are rare, basically resulting from magmatic-hydrothermal activities. Today, these deposits in the Republic of Serbia do not have significant reserves to make their exploitation economically viable. Geological reserves of Ni and Co ore in Serbia amount to about 38.65 Mt, of which about 19.92 Mt of on-balance and approximately 18.73 Mt of off-balance reserves, with the on-balance located in Kosovo i Metohija [56] (i.e. about 52% of geological reserves), and off-balance in the area of Serbia. On-balance reserves of Ni are in the amount of about 1.49 Mt, and off-balance reserves of Ni are in the amount of about 27 Mt.

Coke coal - Coking coal is distributed in the east and southeast of Serbia within the deposits, whose exploitation takes place on a tiny scale within the JP PEU Resavica, exploitation geological research is carried out within the active mines.

Fluorite - is located within hydrothermal wire fluorite-sulfide deposits (Cu, Zn, Pb), quartz-calcite deposits (Ravnaja), quartz-fluorite deposits (Koprivnica) as well as predominantly fluorite deposits (Cer, Željina) related to pegmatites, i.e. ore occurrences and fluorite deposits are located in the area of western and central Serbia. Geological reserves of fluorite are about 0.721 Mt, of which the on-balance reserves are about 0.706 Mt, and off-balance reserves about 0.01 Mt, with an average content of approximately 28.58% CaF₂ (with 3.4% Pb and 0.44% Zn), and belong to the deposits of Ravnaja in western Serbia and Koprivnica on Kopaonik. There is a possibility to enable the translation of mineral resources into reserves (geological into on-balance reserves) through additional geological research, and thus significantly expand the existing mineral resource base of fluorite in Serbia. All of the above could serve as a valid basis for the valorization of domestic fluorite in the economy of the Republic of Serbia. There is no active geological research and exploitation of fluorite in Serbia, nor data on import-export.

Gallium - is concentrated in sphalerites (up to 0.5%) and ash of individual coals (up to 1.5%). Thus, gallium appears in polymetallic deposits, and zinc concentrates from Pb-Zn deposits contain between 5-15 ppm of gallium and copper deposits in eastern Serbia. Gallium occurs in significant concentrations in bauxites in the area of Počuta, Tara, Mačkat (7-20 ppm), and significant

potentials have been determined in the vicinity of Babušnica and Klina (AP Kosovo and Metohija [56]). The ore occurrences and deposits in question are of small size and medium quality. There is no statistical or other available data on quantities, i.e. scope of exploitation and data on imports and exports.

Germanium is bound to Pb-Zn deposits in Central Serbia and appears in copper deposits within the Bor metallogenetic zone (0.12-0.25 ppm) of Eastern Serbia (copper deposits of Bor and Majdanpek). Germanium is also present in coals in Eastern Serbia (Vlaole; up to 400 ppm) and in the domain of the granitoid massif of Bukulja in Central Serbia (up to 100 ppm).

Currently, outside the domain of active mining production of Cu and Pb-Zn, there are active geological surveys of copper, lead and zinc in Western Serbia, which are essential for determining the potential of germanium. In flotation concentrates, Pb-Zn deposits, the content of germanium, depending on the composition of the ore (galenite), appears in smaller quantities, considering that most of it goes to tailings in such flotation conditions.

When it comes to Cu deposits, then the conditions of its concentration are somewhat more favourable. Germanium is concentrated in smelter dust (agglomeration frying dust) and in metallurgical slag during the processing of copper ores, then in agglomeration dust, etc.

Hafnium - occurs in almost all granodiorite complexes in Serbia, but in lower concentrations in zirconium, as well as in alluvial deposits in their vicinity, such as the alluvium of the Cernička, Toplička and Lešnička rivers, in Eastern Serbia. There is no active geological research or active exploitation.

Heavy rare earths (It, Tb) - elements of river lands in Serbia occur within the copper, uranium and lead-zinc deposits in central, eastern and southern Serbia, i.e. within the Surdulica granodiorite complex, as well as the granitoids of Božica and Doganica. They are obtained by exploitation as a by-product of Cu, Pb-Zn reserves. There are currently no active geological surveys of difficult rare elements in Serbia and data on imports and exports.

Light rare earths (Sc, Ce, Nd) - Occur in paragenesis with the appearance of rare earths in granitoid complexes, which represent primary sources, as well as in alluvial deposits in their vicinity. They appear in the deposits of copper and uranium (where they are also an indicator of the appearance of uranium). They are currently obtained as a by-product of mining activities and copper mining in the deposits of Eastern Serbia. No import-export data.

Indium - Occurs in polymetallic deposits related to the Serbian-Macedonian metallogenetic province, i.e., sphalerite, chalcopyrite, galena, and others. Its concentrations range from 90 ppm (with iron) to 250 and 3200 ppm (with lead and zinc). In that respect, the deposits of lead and zinc in Veliki Majdan (western Serbia), Trepca, Kišnica, Belo brdo and Novo brdo (AP Kosovo and Metohija [56]) are essential. Indium deserves further attention and is one of the elements valorized with positive economic effects. Exploitation occurs as a by-product of the active exploitation of copper and lead zinc. No import-export data.

It should be added that in processing ores containing indium, i.e. obtaining flotation concentrates, it is in concentrate in the range of 10-70%, while in tailings, it is in the range of 30-90%. They are

also obtained from smelting dust and from return and waste solutions during the processing of copper ores, then in intermediate products from the refining of lead and zinc.

Magnesite - Magnesite deposits are positioned in peridotites (wire and mesh type mineralization) and lake Neogene basins (hydrothermal-vulcano-sedimentary deposits and detrital sedimentary deposits) in central, southern and northern Serbia. Geological reserves of magnesite in the Republic of Serbia amount to about 33.29 Mt and include on-balance reserves in the amount of approximately 28.54 Mt and off-balance reserves in the amount of about 4.75 Mt. Potential (geological) reserves of magnesite of the Republic of Serbia amount to about 6.5 Mt. The Republic of Serbia has and is partially provided with on-balance reserves of magnesite so that the needs in the subsequent development period of twenty years can be met with existing reserves. Still, geological research and translation of current resources into on-balance reserves of magnesite are necessary. The exploitation of magnesite in Serbia is not currently carried out, and initial steps have been taken to restart production. Geological surveys are not performed, and no import-export data are available.

Natural graphite - in terms of ore occurrences, is associated with the crystalline shales of the Vlasina complex in southeastern Serbia, at the sites of Gornja Ljubata and Donja Ljubata, near Bosilegrad, near the lead and zinc deposits Grot, Kriva Feja (Vranje). Graphite occurrence in crystalline has been ascertained and investigated to a lesser extent at the Balta-Berilovica locality (near Knjaževac) and at the Bresjanska reka - Krčeva reka locality, near Paraćin. Graphite is not exploited, and geological research is not active. No import-export data.

Natural rubber - There is no data in Serbia (which is understandable considering its structural-geological-metallogenetic spatial position).

Niobium - is concentrated in both metallurgical slag and in waste and return solutions during the processing of copper ore.

In terms of occurrence, niobium is related to pegmatites and parts of the rock part of specific granotoid complexes, which appear in separate parts of the Serbian-Macedonian metallogenic province (Cer, Bukulja and Kukavica). Niobium was not a particular subject of research, so today, the level of analysis is insufficient. There is no active geological research or exploitation of niobium in Serbia today, and there is no data on imports.

Platinum group of metals - heavy (Os, Ir, Pt) and light (Ru, Rh) - They are located within the deposits with ore association Fe, Ni, Co, As, Se, Te, Sb, Cu, Au as well as in alluvial deposits. Current o Geological research of the platinum group of metals is not performed, and there is no exploitation of these metals in Serbia.

Phosphates - Geological reserves of phosphates have been determined in the Vlasina complex of Rhodope crystalline in the south of the Republic of Serbia and amount to about 107 Mt. Of that, the on-balance reserves are about 72 Mt, with an average content of about 9.1% P₂O₅ has been shown by previous research. Potential resources amount to about 300 Mt. currently, geological surveys are not active, and there is no exploitation of them or data on imports.

Phosphate rock - No data for the Republic of Serbia, except for incomplete data on peat vivianites (iron hydrophosphate with P₂O₅ content up to 28%) or wetland phosphates, which are in the

domain of Lake Vlasina, in southeastern Serbia, in the area of Tutin in the far south and in the area of Kovin, northeast of Belgrade, on the territory of AP Vojvodina. The phosphatized carbonate rocks (francolite) in the domain of the Krčeva river, not far from Paraćin in Central Serbia, is known. Geological research of particular peat bogs is currently being initiated.

Scandium - in the Republic of Serbia has not been specifically researched and considered. It is assumed that it is concentrated in the grazenized parts of the Neogene granitoid complexes of Serbia. No special geological surveys are carried out or exploited.

Silicon metal (diatomite and trepel) appears as sedimentary silicon rocks and coal in central and eastern Serbia. Exploitation is performed with the exploitation of coal and quartz rocks.

Tantalum - is related to pegmatites and parts of specific granitoid complexes, especially in the Serbian-Macedonian metallogenic province, and niobium tantalum is also concentrated in alluvial deposits of some rivers located in their vicinity (e.g. in the alluvium of Lesnica and Cerska rivers). Currently, geological research of niobium tantalum is not performed, and there is no exploitation, except that a smaller scope of testing of their technological properties was performed at the beginning of this century.

Tantalum is concentrated in both metallurgical slag and waste and return solutions in the processing of copper ore. No import data.

Tungsten - is bound to Skarn and wire hydrothermal deposits. Geological reserves in the Republic of Serbia amount to 0.33 Mt, and in terms of quantities, the most significant concentrations of tungsten are located in Blagojev Kamen (0.025 Mt). Then tungsten appears in Golija, Tanda (Gornjan granitic massif) and on Kopaonik (0.270 Mt). Potential resources 300 Mt. There is no active geological research or exploitation and no data on imports.

Vanadium - most often appears together with sedimentary deposits of uranium, and it is also found in oil deposits, as well as in the rest of the coal, in the ash. It is widespread in central, eastern and southern Serbia. There is no particularly active geological exploration of vanadium or exploitation. No import data.

Bauxite - Karst-type red bauxite deposits are located in the area of Poćuta (not far from Valjevo) and Mačkat on Zlatibor, in the area of Babušnica in SE Serbia and in the area of Klina (AP Kosovo i Metohija [56]). The total on-balance reserves of bauxite in Serbia amount to 1.195 Mt. The bearings are miniature in size and of medium quality.

Lithium - According to the results of previous geological research in the Adriatic basin in western Serbia, a deposit of boron and lithium was discovered, which with the quantities and content of lithium and boron in the ore is one of the most significant potentials in the world. The unique mineral jadarite $\text{LiNaSiB}_3\text{O}_7(\text{OH})$ was discovered. The content of ore in the deposit is 1.7% Li_2O_3 and 13.95% B_2O_3 , and the total on-balance reserves in the amount of 158 Mt of ore, reserve category B and C₁ were verified.

Geological research of lithium in the Republic of Serbia is being performed, and active exploitation or production activation of the deposit is expected in the coming years.

Titanium - mineral occurrence of titanium were found in southeastern and central Serbia, on Jastrebac, in Zaovine, where titanium is accompanied by the appearance of vanadium, and it is also present in Deli Jovan and Crni Vrh in Eastern Serbia. Geological titanium exploration is currently not being carried out in Serbia, and there is no active exploitation.

Strontium - occurs in paragenesis with Pb-Zn ore, and according to available literature data, it is found in the clichés of Stari trg (RTB Trepča, AP Kosovo i Metohija [56]). Specific geochemical indications of strontium (2500-5000 ppm) have been found in the domain of the Adriatic Paleozoic sedimentary rock complex, north of Valjevo in the area of Western Serbia. There is no active research or exploitation of strontium in the Republic of Serbia.

Bearing in mind that secondary sources of critical mineral raw materials are realized by applying particular technologies for extracting minerals from mining waste, i.e. its recycling, which is a consequence of earlier extraction of minerals from primary sources, it can be said that secondary sources can only to a certain extent replace primary sources of mineral raw materials, without losing at the same time, nothing on the quality and properties, and all for the reason that all existing mineral raw materials cannot be fully recovered by applying recycling technology.

Specific CRM has the potential to be recycled. Still, the frequent lack of input raw materials (quantities, quality) does not meet the conditions for the possibility of applying the circular economy model, all due to the underdeveloped recycling rate. There are also problems of economic unprofitability of recycling and even environmental acceptability/unacceptability.

Mining waste is waste generated from geological exploration, exploitation and preparation of mineral raw materials. Keeping in mind the mining tradition that has been going on in Serbia for centuries, accumulated/disposed of mining waste, in the historical sense, is today an important secondary source of various mineral raw materials, primarily metals and CRM. Therefore, mining waste is one of the secondary sources of critical mineral raw materials. Still, today at the level of the EU and Serbia, there is no adequate data on how many essential mineral raw materials can be extracted from mining waste in an economically viable and environmentally acceptable way.

The Cadastre of Mining Waste project worth 2.1 million euros, supported financially by the EU, was implemented from February 2017 to January 2020 and successfully achieved the main project goal of further developing and improving the system for managing mining waste in Serbia. On that occasion, 250 locations with mining waste were recorded, for which evolution was done, and 41 sites were selected, which will be the subject of further examination [44].

According to the National Strategy for Sustainable Use of Natural Resources and Goods from 2012, tailings generated as a historical consequence of mining have been recorded in Serbia.

Table 2: Secondary sources of CRM in Serbia [21].

No.	Tailing dumps	Surface (ha)	Quantity of material (Mt)	Content (highlighted CRM)
Cu deposits				
Flotation tailings dump “Bor“				
1.	Active flotation tailings Bor	86	50-60 Mt of tailings	Cu approx. 0,20%
2.	Old flotation tailings dump in “Bor“	57.60	30 Mt of tailings	Cu approx. 0,25% Au approx. 0,4 g/t Ag approx. 1,7 g/t
3.	Active flotation tailings dump “Veliki Krivelj”	483.36	190 Mt of tailings	Cu approx. 0,10%
Slag “Bor”				
1.	Depo 1	1.3	11.19 Mt certified balance reserves of technogenic mineral raw materials, 2005	Cu approx 0.715%, Au 0.282 g/t , Ag 4.5 g/t, Mo 0.0413% Fe ₂ O38.60 %
2.	Depo 2		1,9 Mt of slag	Cu 0,65%
3.	Depo 3		0.7 Mt	Cu 0,70%
4.	Depo 4		1-1,5 Mt of slag	Cu 0,60%
Pb-Zn deposits				
1	Flotation tailings “Grot”		550 Mt of tailings	Pb, Zn, Ag, Cd
2.	Flotation tailings “Rudnik”	Projected up to 40	8.7 Mt of tailings	Cu 0.1055%, Zn 0.31%, Pb 0.10%, Ag 11.6 g / t, Fe 6.735%, Bi 45 g / t, Cd 20.8 g/t, Ca 5.84% .
3.	Flotation tailings “Lece”		2.7 Mt of tailings	Au 1,33 g/t, Ag 3,64 g/t In 17 g/t

Given that tailings are valuable secondary sources of critical mineral raw materials, and that mines that have been exploiting Cu, Pb-Zn, etc. for decades, have produced millions of tons of different types of mining, flotation and metallurgical waste, this is a valuable resource as a secondary source for supplying the domestic and European sectors of the mineral resources market.

The Chamber of Commerce of Serbia, within the Center for Circular Economy in cooperation with the Mining and Smelting Basin Bor, Faculty of Technology Bor and 14 other partners from Slovenia, Bulgaria and Northern Macedonia, is implementing the EIT Raw Materials project "Zero waste recovery of copper tailings in the ESEE region" (RIS CURE). The project lasts from January 1, 2019 - to December 31, 2021.

The activities of the project EIT Raw Materials are aimed at an innovative approach based on the paradigm of zero waste. After valuable raw materials such as CRM and other metals are separated, the remains can be recycled for the construction sector, road construction, etc. Such a holistic eco-innovative approach to extracting valuable metals and the practical use of residues after metal extraction guarantees the successful development of a regional innovation scheme based on tailings utilization. For economic reasons, is the most cost-effective organizational, technological, environmental, and social. This should undoubtedly lead to an enabling environment to encourage

entrepreneurship and intra-entrepreneurship in the region, based on research and identification of secondary sources of mineral resources.

The results of this project will contribute to a complete understanding and assessment of the potential of critical mineral raw materials based on secondary sources.

2. Applications in crucial sectors

EU countries have clearly defined that critical raw materials are significant for their economic development, i.e. their economies are 100% dependent on imports of antimony, lithium, beryllium, cobalt, germanium, indium, magnesium, niobium, platinum groups of elements, elements from the group of rare earths and tantalum. The EU also imports 95% of the total amount of graphite, 73% of tungsten and 69% of fluorite. The dependence of the import of critical mineral raw materials arises due to the lack of that mineral raw material, i.e. the lack of deposits of the minerals in question, but also increased due to economic, environmental and social constraints and risks in the process of exploration and exploitation of mineral raw materials.

An **energy system** based on clean energy technologies differs significantly from traditional systems based on hydrocarbon resources, also in that they mostly use critical mineral raw materials in their composition. **Wind turbines** are one of the most important aspects of renewable green energy sources, and permanent magnets in wind turbines contain the main critical minerals. The following essential mineral raw materials are used for their production: borates, niobium, dysprosium and neodymium (NdFeB; neodymium magnets are made of alloys neodymium, iron and boron).

The construction of **solar photovoltaic power plants** and electric vehicles requires more minerals that belong to critical mineral raw materials. A typical electric vehicle needs six times more minerals than conventional cars. Modern energy technologies using indium, gallium, germanium, selenium, tellurium, neodymium, lanthanum, tantalum, vanadium, lithium, silicon, platinum, cobalt, nickel, arsenic, and silver are critical minerals for the production of solar photovoltaic, thermal solar energy, electricity and vehicles. The areas of aviation, communication and defence used to make **aeroplanes, drones, tanks**, and other combat equipment rely on the supply of vanadium, rhenium, cobalt, nickel, niobium, neodymium, samarium, cobalt.

Battery technologies use cobalt, graphite, lithium, niobium, silicon, and tantalum.

Electronics/lighting: use praseodymium, samarium, scandium, europium, gallium, indium, germanium, tin, cerium, lanthanum, zinc and selenium.

Robotics uses many raw materials, of which 19 are classified as critical mineral raw materials, namely titanium, beryllium, gallium, niobium, neodymium, dysprosium, boron, praseodymium and others. 15 essential minerals are used to make **drones:** borates, hafnium, indium, bismuth, beryllium, magnesium, titanium, cobalt, gallium, antimony, tungsten, silicon metal, etc.

Critical mineral raw materials are also used in **digital technology:** lithium, boron, cobalt, magnesium, silicon metal, strontium, indium, tungsten, etc. Magnesium, lithium, silicon, borates, phosphates etc., are used in **pharmacy, health and agriculture.**

3. Demand and supply

Many European countries do not have access to raw materials defined as critical mineral raw materials based on economic conditions - development and supply risks. In this respect, scarce primary sources of CRM are among the fundamental challenges for their supply and supply chain. The complete economic growth in the current technical-technological and economic conditions of the European economies, in general, depends on the supply of critical mineral raw materials, which is primarily conducted in non-European countries (EC, 2018).

Critical raw materials, which do not constitute an input component in Europe, are the following: antimony, beryllium, borate minerals, magnesium, niobium, PGM, phosphorus, rare earths, scandium, tantalum and vanadium. Regarding the supply of CRM, in the current technical-technological and economic conditions of the EU countries, France is the primary producer of hafnium, and, e.g., the leading supplier of lithium to the EU is China.

From the national level perspective and given MSMEs business operations, in the current supply chain, through the examination of the third phase of the project - study, the role and position of CRM from Serbia can be seen in the table below presented by the EU, and updated by the latest data on CRM from the Republic of Serbia.

The subject supply and demand of CRM from Serbia (*Table 3*) is linked to the process of extraction and processing of metallic mineral raw materials: copper, lead and zinc: indium, gallium, germanium) and in some cases (magnesium), they also form their own deposits, which are in exploitation today. The exploitation of primary sources in Serbia does not include other critical mineral raw materials (antimony, industrial minerals, etc.). However, they have significant potential given the explored and proven quantities of mineral raw materials and reserves and the volume of antimony ore mining and processing operations carried out in the past. Thus, more than ten CRM are available, and lithium is also expected to be supplied from primary sources (the Jadar ore deposit near Loznica, western Serbia) over the next 2 to 3 years. There is a good chance that other CRM in Serbia can be supplied from secondary sources, such as technogenic raw materials (mining, flotation, construction and different types of waste).

The role of MSMEs in this process of supplying CRM in Serbia is quite evident, especially if, at this point in time, the process of geological exploration (over a hundred exploration fields in Serbia), current ore extraction and processing, procurement of raw materials during exploration and mining, performing accompanying technical and technological tests and processing, environmental protection, etc.

Table 3: CRM of Serbia from list CRM of EU (2020), supply chain

No.	CRM	Exploration	Extraction	Balance reserves Mt	Potential reserves Mt	Evaluation of the impact of pandemic Covid 19 for supply chain: low or high
1.	Antimony	Active	No-Active	1.061	3.137	Low
2.	Baryte	No-Active	Active	1.2	1.7	High
3.	Bauxite	Active	No-Active	1.19	-	Low
4.	Bismuth	No-Active	Active - a by-product of Pb-Zn ore extraction	-	-	Low
5.	Borates	Active	Active - small production	0.14	48.5	High
6.	Gallium	No-Active	Active - a by-product of Pb-Zn ore extraction; and as coal ash	-	-	High
7.	Germanium	No-Active	Active - a by-product of Pb-Zn ore extraction;	-	-	High
8.	Indium	No-Active	Active - a by-product of Pb-Zn and Fe ore extraction	-	-	High
9.	Lithium	Active	Exploitation jadarite ore planned for 2023.	158		Low
10.	Magnesium	No-Active	Dormant, last 2 years active, small production	28.54	4.75	High
11.	Silicon Metal	No-Active	Active, a by-product of quartz stone extraction	-	-	Low
12.	Tungsten	No-Active	Active - a by-product of Pb-Zn ore extraction	-	0.33	High
13.	HREEs	No-Active	Active - a by-product of Pb-Zn ore extraction;	-	-	High
14.	LREEs	No-Active	Active - a by-product of Cu ore extraction;	-	-	High

4. Post COVID-19 outlook

Considering the CRM supply possibility in the post-pandemic period, according to the data presented so far, it is clear that the situation in Serbia is favourable in that regard and that the prospects for recovery are excellent. In this regard, the recently opened copper and gold mine in eastern Serbia is the primary source of CRM (In, Ge, Ga ...), with many MSMEs participating in its supply chain. MSME's role, in this case, was viewed in the context of numerous subcontractors being hired in the process of further exploration, extraction and technological processing of copper and gold ore.

In addition to the copper and gold mine, a new lithium and boron mine (the primary source of CRM) is planned to be opened. The critical role of MSMEs in this process is already evident both in the planning of extraction and processing of jadarite ore and in the environmental protection area.

In both cases mentioned above, the role of MSMEs is reflected in the high number of hired subcontractors with up to 400 unique business entities in the stage of geological exploration undertaken so far and initial mining activities.

According to the latest data provided by the Ministry [30], the geological CRM exploration on the territory of Serbia carried out before the COVID-19 pandemic resumed to the same extent as before, with a tendency to further increase.

At this point in time, there are flotation tailings of the "Bor" copper mine, serving as secondary sources of CRM where geological exploration of technogenic raw materials, copper and accompanying rare elements is carried out. In addition to this site, another 41 sites have been registered on the territory of Serbia as secondary sources of technogenic raw materials (CRM), which involve mining waste generated in the framework of the past mining operations.

The sites in question (secondary sources of CRM) are mainly privately owned. Mining waste has not been identified as of priority interest, and there is no obligation to extract valuable mineral raw materials from the waste. This fact forms an obstacle to uniform mineral raw materials management (UNRMS). Furthermore, in conditions of application of the circular economy model, this fact creates an essential barrier to achieving the goals of the 2030 Agenda.

A solution to this problem is subject to legislative changes and incentive measures for MSMEs in the CRM supply chain.

The CRM supply chain, which covers geological exploration, exploitation and processing, at this point in time and in the future, may be affected by negative campaigns by citizens' groups, individual institutions and environmental organisations, both locally and regionally, which mainly target international mining companies conducting geological exploration in Serbia. They express their concern, point out possible negative environmental impacts resulting from geological exploration activities related to CRM, and demand that those activities be stopped.

3. Guidelines and Best Practices for navigating challenges for MSMEs in the raw material supply business environment in Serbia (with examples):

1. Business facilitation and business registration

In the Republic of Serbia, according to the provisions of law, there are two legal forms of business activity: companies and sole proprietors (there is also a cooperative, which in practice is less common while it is possible to engage in agriculture without registering a firm). The legal forms are the following: General Partnership, Limited Partnership, Limited Liability Company (the most common form) and Joint Stock Company. A sole proprietor is a legally capable natural person who conducts an activity to gain profit and has been registered under the Registration Act. Following this and related legislation, the position and role of MSMEs in Serbia are also defined.

In 2005, the Republic of Serbia started to practice reforms in business entities registration, mainly to harmonise Serbian legislation with European standards.

A system of registration of financial lease and pledge right over movables and other rights has been established for the first time, and by selecting the Business Registers Agency, the principle of rationalisation, efficiency and self-sustainability of State administrative functions ("a one-stop-shop for business registration"; a five days administrative silence etc.) has been established. The Agency maintains the Register of business entities within which the following registers are kept: Register of Companies, Register of sole proprietors and Register of foreign representative offices (which includes MSMEs) as prescribed by the provisions of the Law on the Procedure of Registration in the Serbian Business Registers Agency ("RS Official Gazette" Nos. 99/2011, 83/2014 and 31/2019).

Electronic registration of the incorporation of single-member limited liability companies (LLC) has been enabled in the Business Registers Agency since 17 October 2018, while the electronic incorporation of multi-member limited liability companies has been allowed since 28 June 2019, i.e. the electronic incorporation of sole proprietors has been enabled since 1 January 2018.

e-Registration is enabled through the System for the Business Registers Agency's users [26]. The application is also available in English.

Considering the benefits of eService, and according to figures covering the period January-September 2021, 2,680 sole proprietors and limited liability companies have been incorporated. The number of users doubled in 2020 compared to 2019, especially during the COVID-19 pandemic. However, this is only 8.1% compared to the number of business entities incorporated based on documents submitted in paper form. The possibility for the remaining legal forms of business entities to offer online registration applications and for changes to and deletion of registered data has been announced for 2022. The electronic registration procedure will be the only registration method within the Business Entities Register, so future users need to prepare themselves for it in good time.

The Business Registers Agency (BRA) provides public access to data stored in its registers via an Internet browser (Google Chrome, Mozilla Firefox, etc.) or via a web service.

Moreover, based on official summary data on the financial position and performance of the business, the Agency publishes macroeconomic analyses of business operations of legal persons and sole proprietors and economic entities in the Republic of Serbia.

In light of the above, it is clear that significant progress has been made in the previous period in Serbia. **Necessary steps have been taken to make business operation and the registration of companies easier** by adopting new laws on the Business Registers Agency and establishing an e-Registration system and related acts. However, according to the World Bank's ranking in terms of business conditions "Doing Business 2020", the Republic of Serbia, although ranked 44th, which is an improvement by four places compared to 2019, in the case of the criteria Starting a Business, obtained a lower score with currently being ranked 73rd. Serbia is planning to position itself among the top ten countries in terms of business conditions on the World Bank's list in the coming years, so the Programme for Improving the Position of the Republic of Serbia in the World Bank's Doing Business list for the period 2020–2023 was adopted in 2020. ("RS Official Gazette" No. 89 of 25 June 2020) [47].

All the above represents **a favourable business environment, guidelines, guides and best practices to which MSMEs in Serbia are exposed or by which they are surrounded**, especially those in the business environment of the supply chain of mineral raw materials, i.e. of all natural resources. In 2020, the mining sector comprised 361 enterprises with 15,825 employees, 292 of which were micro, 46 small, 15 medium-sized and 8 large-scale enterprises.

2. Policy, legal and regulations

According to Article 87 of the Constitution of the Republic of Serbia [46], natural resources are owned by the State. They shall be used under conditions and in the manner provided by the Law. The Law regulating the area of geological exploration and exploitation of reserves of mineral raw materials is the Law on Mining and Geological Exploration ("RS Official Gazette" Nos. 101/2015 and 95/2018 - other Law, 40/2021) [18].

In the last fifteen to twenty years, the expansion of geological exploration of solid mineral raw materials, primarily metals and industrial minerals, in the Republic of Serbia has contributed to the permanent improvement and amendments to the applicable legislation in this field in the period of well-established market conditions for business. Namely, the Law on Geological Exploration and the Law on Mining (both of 1995) were formerly separate legal acts regulating the mineral raw materials sector. These two laws were combined into the Law on Mining and Geological Exploration in 2011, which was in force until 2015 when a new Law on Mining and Geological Exploration was passed, as well as amendments to that made in 2018 and 2021, which are consolidated in the Law on Mining and Geological Exploration.

The Law in force contains provisions for a more streamlined approach to the exploration of mineral raw materials and other geological resources, which results in speeding up administrative procedures which are conducted, following the provisions of the Law on General Administrative Procedure (2016) as the primary administrative act of the Republic of Serbia, by the Ministry of Mining and Energy (e-mining has been introduced, the Chamber of Mining and Geological Engineers of Serbia is established, etc.).

In that respect, the procedure for obtaining approval for geological explorations is clear and simple enough with the possibility of transferring the support to another legal person under conditions established by the Law.

Also, these legal arrangements specify the obligation to draw up a new Rulebook on Reporting Exploration Results, Mineral Resources and Mineral Reserves, for solid mineral raw materials,

which has to be based on envisaged by the Law on the applicable Pan European Reporting Standard (PERC).

Unfortunately, except for the PERC mentioned above, other international and well-known mineral resources and reserves reporting systems (JORC; Ni 43 101...) as well as the global United Nations Framework Classification for Resources (UNFC) system and the current United Nations Resource Management System (UNRMS), are not covered by this legal act, although in Serbia all the prerequisites for the implementation and application of the UNFC and UNRMS classification systems and resource management are met. **Namely, the national strategic document "Development Partnership Framework for 2016-2020 between the Government of the Republic of Serbia and the United Nations Country Team," which was jointly signed in May 2017, as a special programme priority, underlines support for harmonization of mineral resources data in Serbia with the United Nations Framework Classification for Resources (UNFC), i.e. for its implementation in the sector of mineral resources, and provides for the assistance by the United Nations in achieving this goal. [41]**

The Law on Mining and Geological Exploration provisions stipulate that the mining policy and the plan for the development of geological exploration and mining shall be implemented through the execution of the mining and geological resources management strategy. The Strategy lays down long-term goals for mining and geological exploration of energy, metallic, non-metallic and technogenic mineral raw materials, groundwater and geothermal resources. The Strategy shall be adopted by the National Assembly of Serbia on a proposal from the Government for at least ten years. The Government monitors the execution of the Strategy and, where necessary, initiates bringing the Strategy into line with actual demand for mineral raw materials, but may, on a proposal from the Ministry, adopt an action plan and Strategy execution programmes, when necessary.

In 2011 the Government formulated a proposal for the Strategy, but it was not adopted by the National Assembly of the Republic of Serbia.

The following examples illustrate the extent to which we today live in fast-changing times and how quickly some decisions and priorities regarding the sustainable use of mineral resources are changing. Namely, one of the activities envisaged in the proposal for the Strategy of 2011, with a ten-year time frame for execution, is the Programme for the Promotion and Sustainable Development of Mining and Geological Exploration, which, as one of the priority directions and development programmes, emphasizes the exploitation of ferronickel ore in the area of Mokra Gora mountain in Western Serbia, and in the area of Lipovac near Arandjelovac, Central Serbia, (Ni on the EU CRM List 2020). However, in 2011, the Municipality of Arandjelovac has adopted a Spatial plan for the special-purpose areas prohibiting the exploitation of metallic mineral raw materials on its territory and a decision banning the geological exploration of nickel and cobalt in 2012. In a roughly similar way, geological exploration of ferronickel ores mineralization and occurrences in the area of Mokra Gora has been abandoned.

All this has resulted in the 2021 Law provision providing for the mandatory prior agreement by the Government of the Republic of Serbia for applied geological exploration and exploitation of uranium, nickel and cobalt. The previous proposal for the Strategy will undergo significant amendment (we can freely say that it will be necessary to draft an entirely new text) to include all legal changes which occurred over the last ten years.

Serbia is currently implementing the National Strategy for Sustainable Use of Natural Resources of 2012 ("RS Official Gazette" No. 33/2012) [21] governing the mineral-raw materials industry in Serbia in a cross-sectoral, complete and comprehensive way.

In line with the Green Agenda as a new model of economic growth for Serbia in the energy sector, the Government of the Republic of Serbia has adopted two laws (renewable sources, energy efficiency) and one amendment to the Law (energy) based on which two strategic documents are being developed: the Energy Development Strategy until 2040 with projections to 2050, with an Action Plan and the Integrated National Energy and Climate Plan until 2030 with forecasts to 2050.

To enable the functioning of MSMEs in the mineral raw materials sector within the mining industry, it is necessary to adopt a strategic document - the Strategy of Mineral Raw Materials Management which, despite the imposed legal obligation, does not yet exist in the Republic of Serbia.

3. Access to data, information and knowledge

Examining available **data and information and acquiring new knowledge** can quite indeed be observed through the benefit from the volume of financial investment in the geological exploration process, mining, and accompanying processing activities and capacities. The Ministry of Mining and Energy has two information systems, CIS GIR and GeolISS, which were developed when parts of geology and mining were under the jurisdiction of two separate ministries (the Ministry of Mining and Energy and the Ministry of Environmental Protection). To this day, these are two different information systems that cross-reference only the data on issued approvals for geological exploration and exploitation through web services. CIS GIR contains data on exploration and exploitation fields and certified reserves for solid mineral raw materials, oil and gas. Part of the data is publicly available on the Ministry of Mining and Energy's website, where data on exploration and exploitation fields of groundwater and petrogeothermal resources are also available. GeolISS contains data on exploration and exploitation fields and certified groundwater and petrogeothermal resources reserves. Some data related to the relevant activities of geological exploration, exploitation of reserves, or processing of metal ore and other minerals are also available on companies' websites, the Business Registers Agency, the Chamber of Commerce of Serbia, the Statistical Office of Serbia, and other state institutions.

The law also stipulates that the cadaster of mining waste fields and the cadaster of abandoned mines and mining facilities shall be managed by the Ministry of Mining and Energy, i.e., by the competent authority of the Autonomous Province. The cadaster of the mining waste project has been completed, and an application is currently being set up on the Ministry of Mining and Energy's website. A certain level of data will be publicly available through this application. These data will help understand the aspect of secondary CRM sources, which is particularly important for the circular economy model.

The Geological Survey of Serbia [29] manages the Geological Documentation Fund that contains valuable results of geological explorations conducted in the last 50 or more years in the area of former Yugoslavia. The Geological Documentation Fund consists of over 6,000 documents (studies and reports on geological explorations) and about 21,000 printed geological maps of a general and particular purpose, processed and arranged data by place and type of exploration. The documentation of the Fund may be used by interested parties for a fee prescribed by law. It is

important to note that, of all the available data, only the sheets of the 1:100 000 Basic Geological Map have been digitized, and only they can be obtained in vector form. Other documentation is only available in paper form.

Digitization of data from the Fund of the competent Ministry of Mining and Energy, i.e., from the Geological Survey of Serbia, would contribute to a better understanding and analysis of geological data and better management of mineral raw materials in Serbia. It is a massive undertaking that requires time and considerable financial resources, but essential and necessary.

Under appropriate conditions, the Republic of Serbia may use the results of current geological explorations carried out by corporate entities. **However, the obligation to submit digitized data is not prescribed anywhere, so if the state wants to use this data, it must digitize them itself.** The same is the case with the results of geological explorations submitted by the exploration holders.

In the last ten years, the Geological Survey of Serbia has been presenting the results of essential geological explorations through the GeolIIS information system, forming a digital database.

Part of the results of geological explorations from the previous period is kept in the State Archives of Serbia and is publicly available.

In general, a significant issue is the lack of cooperation and horizontal connection between institutions in terms of exchanging geological and accompanying data. There should be no grounds, especially since the technical conditions are met as most of these data are in GIS format.

4. Entrepreneurship skill facilitations

Entrepreneurship, i.e., the entrepreneurship environment, is affected by all elements of the entrepreneurial ecosystem, such as government policies, regulatory framework, institutions, finance, culture, education, human capital, local and global markets. A better economic environment cannot be created without a solid institutional and legal framework, nor can entrepreneurship be achieved exclusively through the law, without changes in the education system. (CEVES, 2017) [48].

In the last few years, entrepreneurship in Serbia has received much more excellent support from the state. Based on that, 2016 was declared the "Year of Entrepreneurship", which later evolved into the "Decade of Entrepreneurship". In this sense, several different strategies have been adopted (Strategy for Supporting the Development of Small and Medium Enterprises, Entrepreneurship and Competitiveness 2015-2020 and its action plan; National Youth Strategy 2015-2025; Strategy for Education Development by 2020; Industrial Policy Strategy of the Republic of Serbia from 2021 to 2030 with the 2021-2023 action plan; National Strategy for Gender Equality (2016-2020), and others), with which the state gives full support to entrepreneurship and participates in solving the entrepreneurship-related issues.

Relevant strategies and action plans include activities and interventions such as introducing entrepreneurship education at all levels of the education system, teacher education and entrepreneurship training, development of non-formal education systems for improving practical knowledge and skills, etc. All the activities mentioned above are aimed at mastering or "facilitating" entrepreneurial skills.

For example, the Strategy for Supporting the Development of SMEs, Entrepreneurship and Competitiveness 2015-2020 defines six strategic goals to facilitate-master entrepreneurial skills. These goals are as follows: boosting the business environment; improving access to funding sources; continuously developing human resources; strengthening the sustainability and competitiveness of SMEs; improving access to new markets and developing and promoting the entrepreneurial spirit and encouraging women's, youth, and social entrepreneurship.

The Industrial Policy Strategy of the Republic of Serbia from 2021 to 2030 includes a wide range of economic activities, with a focus on the processing industry. Enhancing the competitiveness of the national economy has been expressed as a high priority. In that sense, the general objective of the Strategy is to raise the competitiveness level of industry in the Republic of Serbia. The new communication of the European Commission from March 2020 is of importance for this competitiveness, as it defines digitalization and circular economy as the two most important processes for economic growth and recovery while considering all the effects of the crisis caused by the COVID-19 pandemic. Correspondingly, the current Action Plan encompasses five different activities (digitalization, innovation, investment, export restructuring, and circular economy), which, following facilitating entrepreneurial skills, should alter the image of economic activity in the Republic of Serbia and significantly contribute to overall economic growth.

To create a more favourable business environment for entrepreneurial business, the Ministry of Economy has launched the Entrepreneurship Portal, which is intended for all entrepreneurs and those who wish to become entrepreneurs [32]. The goal is for entrepreneurs to get information in one place about what they need to start a business and how to get support for further business development and achieve good business results accordingly. The idea behind the Entrepreneurship Portal is that, through timely information on all direct financial and support measures, the Portal will be an efficient service of the economy and encourage the development of entrepreneurial spirit in Serbia.

The portal provides information on e-services for MSMEs, tax reliefs, and customs reliefs on equipment imports. There are also EU support programmes for entrepreneurs and information on possible access to financing. The implemented programmes are divided into three areas: support in starting a business, growth and development help, and support for innovation and digitalisation.

In terms of business operations, the SMEs' sectoral concentration does not change significantly over the years. Concentration in non-tradable sectors dominates, with every third company or entrepreneur from SMEs operating in wholesale and retail trade, followed by the services and processing industry.

The structure of SMEs in the processing industry is dominated by corporate entities operating in low-tech areas, with products of low added value and differentiation, which results in their weaker market position and low price and profit margins. SMEs are still not sufficiently export-oriented. In the total number of SMEs, exporters make up only 4.3 %, while the share of exports in turnover is a modest 9.1 %. Despite a more dynamic growth of exports in the last few years, exports per employee are lower by 1/3 compared to the average of the non-financial sector. The great disproportion in the achieved level of economic development in the Republic of Serbia is also reflected in the distribution of the number of SMEs and their results. The SMEs development level by area in the Republic of Serbia, measured by the GVA indicator per employee, indicates the ratio of places with the highest (city of Belgrade) and lowest indicator value (the Pčinja Administrative District) is 2.3:1.

It is important to emphasize that entrepreneurship is something to be learned. Starting and growing your own business is indeed constant learning. The best way to learn is to carefully consider and analyze your own and other people's experiences, mistakes included. A good entrepreneur needs to know the target market well, to manage finances efficiently, to achieve good promotion, to be visible on the market, to choose the employee team wisely, to know the economic situation that could affect the result of his work, to rationally manage the supply chain, and to evaluate risks. Quality education in acquiring entrepreneurial skills marks the difference between a successful entrepreneur and someone who merely owns startup capital.

When it comes to young people who want to venture into entrepreneurship, they lack the essential information and practical skills that entrepreneurship requires, which can be attributed to the lack of experience and formal entrepreneurship education. Although the SIPRU 2015 programme introduced entrepreneurship as a pilot subject in 200 vocational schools funded by donors, the coverage was insufficient, and the programme itself faced sustainability elements - problems. The critical shortcoming is the lack of continuity in training and certain types of mentoring and better links and mutual business cooperation between institutions involved in these activities. In practice, the training sessions overlap and cover similar topics. They are primarily oriented towards starting a business and founding a company. Few are dedicated to developing skills necessary for business growth, such as market opportunities, idea development, finding funds, customers, etc.

EXAMPLE: The Project "**Development of SMEs by improving market access through entering supply chains, with special focus on women entrepreneurship**" [26] run by the Serbian Chamber of Commerce and the Association of Business Women in Serbia, with financial support provided by the Development Agency of Serbia, aimed at improving the status of **micro, small and medium-sized enterprises (MSMEs)** and sole proprietors on the market, encouraging the networking among large and small companies and the creation of a sustainable "ecosystem" in the national economy.

In the context of the Project, the following activities were implemented: setting up a database of women entrepreneurs, setting up a database of large enterprises - customers, creation of a platform for establishing business cooperation between large customers and women entrepreneurs, organisation of business meetings between large companies and women entrepreneurs, training of women entrepreneurs to prepare them for collaboration with large companies and by creating supply chains, mentoring services for women entrepreneurs to establish and maintain business cooperation with "large customers", creation of an on-line directory of large companies and women entrepreneurs, drawing up a guide on how to enter the supply chain, and producing an electronic catalogue of women entrepreneurs' products.

This can be illustrated with an example. Women entrepreneurship across various fields (crafts, tourism, health, ...), and in the last few years regularly is present and very successfully presented at the already traditional annual Economic Summit of Serbia, which gathers representatives of governments, ministries, businessmen, economic institutions, financial experts, bankers, media, etc., both from Serbia and neighbouring countries.

All of the above is, with certainty, the result of successfully acquired entrepreneurial skills.

5. Market access

Market access is one of the key and direct factors influencing the development and improvement of operations of MSMEs both in the Republic of Serbia and at a broader level. The upward trend in exports in Serbia is reflected in the domestic economy, such as increased productivity, economic growth and national income growth, and reduced unemployment; therefore, one of the critical priorities is more significant entry into new markets by MSMEs.

In periods of slow economic activity, MSMEs have shown remarkable resilience, which is visible through a faster and easier system of adaptation to new conditions and a significant shift and orientation towards exports. This basically included various activities such as the more significant increase in the use of the internet and options offered by other forms of access to the global market, association through clusters and business incubators, etc.

However, when entering the domestic or foreign market, MSMEs face various obstacles such as exports funding and insurance, lack of information concerning markets, problems in finding potential customers and adequate partners. Moreover, they face highly complex rules and procedures for foreign trade operations and challenges of harmonisation with foreign law and technical regulations governing exports and market conditions.

Keeping in mind the problems mentioned above faced by MSMEs in ensuring adequate market access, the Development Agency of Serbia (DAS) in 2020 adopted appropriate measures, one of which concerns the Programme of Standardised Set of Services for Micro, Small and Medium-Sized Enterprises (MSMEs) and Sole Proprietors. This measure reflects the improvement of the availability, scope and quality of support services. The second measure is the Support Programme for Companies to Enter the Supply Chains of Multinational Companies to enable them to improve their knowledge, enhance business performance, expand business operation into new markets, and establish cooperation with multinational companies (MNCs) their suppliers. Therefore, professional and financial support is provided to help business operations improve to enter international value chains for micro, small and medium-sized enterprises (MSMEs) and sole proprietors. [28]

Regarding the mineral raw materials sector or the mining sector in Serbia, there is a vast range of factors affecting the market access for MSMEs. It is well known that there is practically no economic activity in the development of society that does not involve the mineral raw materials sector, i.e. there is no human activity in which mineral raw materials do not constitute an active part. In the first place, the role of MSMEs is to conduct geological exploration, then to provide services in the area of equipment supply and services provided in the investigation, exploitation and processing of mineral raw materials. Still, MSMEs are also direct users of the mineral raw materials sector products.

In the current market and market access conditions, the mineral raw materials sector of the Republic of Serbia is characterised by a certain degree of technological lagging, obsolescent processing, industrial and technical capacities and, consequently, increased technological dependence on other countries. This is mainly because the significant production and processing accommodations were state-owned in the previously existing social conditions before the social transition trends began.

However, over the last two decades, the ownership structure in Serbia has wholly transformed so that the former (metal etc.) mines in so-called "social ownership" have undergone changes in the

sense that they were privatized. Foreign investments in the process of geological exploration of mineral raw materials and their exploitation (metals, oil and gas and industrial minerals) have resulted directly in the creation and adoption of modern technologies, new and unique knowledge, etc.

What is crucial for the proper functioning of MSMEs in the mineral raw materials sector or the mining sector in Serbia is the need for "accelerated" adoption of the Strategy of Mineral Raw Materials Management, the initial version of which was drafted about ten years ago.

However, the role of SMEs has not been adequately considered in this context, especially bearing in mind that, currently, international multinational mining companies are developing large exploration projects in the Republic of Serbia. Accordingly, a considerable involvement of MSMEs in the mineral raw materials sector supply chain is expected.

Given the size of the domestic market and the purchasing power, it is evident that the domestic market cannot be a powerful engine for the growth of domestic enterprises. Still, instead, it is necessary to increase the volume of exports, improve the structure of exports and ensure greater participation of MSMEs in supplying large national economic systems, i.e. provide those systems with raw and production materials they currently import. In that respect, the government activities of the Republic of Serbia aimed at achieving the market economic conditions of the "Open Balkans" would make remarkable progress in the operation of MSMEs. Moreover, given the signed "free" trade agreements for the export of duty-free goods to markets of CEFTA and EFTA countries, Russia, the Eurasian Economic Union, and Turkey, as well as preferential trade regimes with the EU, USA, Japan and Australia, access to their markets are highly "favourable" for MSMEs, as well as the appropriate duty-free administration covering most of the vital industrial products (with only a few exceptions and annual quotas for a limited number of goods).

It is a fact that many companies from Serbia operating in the mineral raw materials sector - mining sector have limited capacity, as well as the insufficiently developed level of cooperation within the international framework, so today, it is more challenging to respond to current requirements and standards. However, there has been particular progress in the said domain.

Precisely, defined clusters represent a way to overcome individual limitations with combined capacities, raise the level of competitiveness, enable access to large markets and direct access to funds and more favourable loans.

According to the Statistical Office of the Republic of Serbia's data [27], industrial production in the Republic of Serbia in 2020 had increased by 0.4% compared to 2019.

Compared to the previous year (2020/2019), in the Covid-19 circumstances, the mineral raw materials sector, i.e., the mining sector, achieved a 2.6% growth. The processing industry sector grew by 0.1%. The production of petroleum coke and oil derivatives, food products, metal products (excluding machines), and the production of electrical equipment and, accordingly, the exploitation of metal ores had the most significant impact on the growth of the industrial output.

When it came to producing energy products in the Republic of Serbia in 2019, coal production was the most significant share, at 38.47%.

In the same year, oil and oil derivatives had a level of imports of 53.27%, as the highest exports were also oil derivatives (43.83%), while electricity exports increased by 25.18% and 30.10%.

According to semi-annual and monthly statistical data, industrial production in the Republic of Serbia in September 2021 grew by 1.4% compared to September 2020. This growth is on average at an 8.9% level of increase.

If the industrial production in Serbia is summarized for January - September 2021, compared to the same period in 2020, in that case, it is evident that it is significantly higher in these Covid-19 circumstances and is at the level of 7.3%. Viewed **by sectors**, in September 2021, compared to the same month in 2020 (where key MSMEs are certainly present), the following economic trends were recorded [25].:

- Mining sector – a 51.8% **growth**,
- Processing industry sector – a 1.5% **decline**, and
- Electricity, gas, steam, and air conditioning supply sector - a 7.1% **decline**.

The aforementioned indicates that Serbia's MSMEs are present in both domestic and foreign markets. Still, there is also the fact that their access, especially in international market and trade conditions and the Covid-19 pandemic circumstances, is burdened by various regulatory and legislative restrictions. In addition, it is inevitable to meet existing standards in the health, safety, and health care sectors in domestic and international market conditions, which is why appropriate standardized measures are adopted that undoubtedly contribute to better, faster and easier access to markets while ensuring supply chain security.

6. Access to finance

Most business entities in Serbia are MSMEs and sole proprietors, which are numerous. The said economic entities differ widely in structural terms. In addition to size, they differ in age, stage of business development, type of business activity, scope, business and financial effects, industry sector, etc. They have different financial needs expressed by financing, amounts, duration, security requirements and repayment regime. Unlike most European countries, Serbia remains exclusively reliant on commercial banks as a source of funding for the economy, with a share of about 92 %. According to the data of the European Commission, the percentage of banks in the financial sector in Europe is 70 %.

Regarding financing for legal entities, MSMEs, the Chamber of Commerce of Serbia, organised several hybrids and online gatherings in the last two to three years. CCS organised a meeting on 29 October. Representatives of microfinance and non-banking institutions from Serbia and countries in the region presented various financial models and successful examples of financing for the economy outside the banking sector.

At this gathering, some expert consultants expressed an opinion that special attention should be paid to financing possibilities while respecting the specific needs and requirements of different industries and production sectors.

It is necessary, in particular, to respect significant differences in financing for innovative and technologically advanced MSMEs from those doing business in traditional industries.

It is estimated that the relaxation of the financial system would also open the market for so-called social investment. This new investment concept in its essence implies a double return on investment: financial return on invested capital and the achievement of positive social return (it is focused on the future; on the support of the children and families, work activation and coping with

new social risks throughout the life cycle). It is estimated that, through social investment, 40 to 60 million euros in direct investments would enter Serbia.

The cooperation with international financial institutions by creating appropriate guarantee schemes for favourable lending to the tiny economy businesses also contributes to the financing for MSMEs.

Complicated administrative procedures and funding applications, high-interest rates inadequate for actual possibilities and needs, unsuitable and short repayment terms, the mismatch between actual demand and available market supply, a limited number of alternative financing options, expensive bank guarantees etc. are all stated to be the main obstacles to obtaining a loan. Banks do not respond to the demand for "small" loans due to excessive risk. Therefore, it is essential to support MSMEs that are in the most challenging position in terms of financing opportunities (MSMEs established in the last two years and those with a business growth tendency).

The RS Government provides financial support to MSMEs both directly through individual ministries and indirectly through institutions it has established for economic development, such as Development Fund, Innovation Fund, Export Credit and Insurance Agency, and Development Agency of Serbia. The scope of financing for legal entities (excluding sole proprietors) by state funds and agencies is 19 times smaller than the scope of the funding by the banking sector. Essentially, the following are available on the market:

- ✓ Investment loans
- ✓ Permanent working capital loans
- ✓ Start-up loans
- ✓ Encouraging entrepreneurship through development projects
- ✓ Loans for business in underdeveloped areas
- ✓ Guarantees
- ✓ COVID-19 liquidity loans
- ✓ Loans for women entrepreneurs and youth

The EU institutions that implement support programmes for MSMEs in Serbia are Horizon 2020 (direct application for grants and acquisition of assets is submitted), Cosme (realized through partner banks or investment funds, and includes loans, guarantees and recapitalisation) and IPARD (in the form of grants and implemented by the Directorate for Agrarian Payments).

The Western Balkans Enterprise Development and Innovation Facility (WB EDIF) aims to increase the availability of funds for SMEs established in the Western Balkans. The total available funds amount to 300 million euros and are available in a guarantee scheme and two investment funds (ENIF and ENEF).

Several international and regional investment funds are active on the market, with their investment focus being on Serbia and other countries in the region. These funds primarily support companies operating in the IT sector. Their founders are mostly international financial institutions (European Commission, European Investment Fund, European Bank for Reconstruction and Development (EBRD), KfW, etc.).

The RS Government has recognized the importance of IT and technological innovation companies, so support models are becoming more common. Tax incentives for innovations are currently being applied, directed towards small technological innovation companies and large systems, i.e. investors, and the incentives also concern intellectual property, research and development. Based

on the discussions during the online conference, "Three directions of increasing access to financing for the MSME sector in Serbia: learning from the experience of the Region", examples of a successful model of financing for MSMEs were presented. On that occasion, an overview of the current situation and the economy's needs was given, with solutions for supplementing the existing regulations proposed.

Access to sources of funding for MSMEs owned by women is inadequate. This particularly applies to the financing for critical sectors such as the agriculture and processing industry and construction, where only one-third of these MSMEs used traditional funding sources. It is assumed that the situation is similar to the mining and CRM production sector, given that no specific data are available.

The reason for this situation can indeed be found in various business hurdles, which are primarily related to the way women deal with regulatory, administrative, social or some other obstacles (e.g. discrimination, corruption, bureaucracy associated...).

Basically, MSMEs most frequently use internal financing sources, including monetary funds, funds from undistributed profits and/or funds from the sale of assets. There are also informal sources of funding (funds raised from family, friends or wealthy individuals (so-called business angels)).

In Serbia, there is a lack of alternative sources of funding that would include microfinance institutions, convertible loan arrangements, financing through debt instruments and equity financing, adjusted for different stages of business. As an example of an alternative way of funding, Crowdfunding (through a platform that connects companies and investors) has been present on the Serbian market since last year.

MSMEs in Serbia operating in applied geological exploration and exploitation of mineral raw materials (CRMs) are mainly privately and foreign-owned and rely on private sources of funding. During the applied geological explorations, MSMEs face difficulties securing financial resources on time (various funds, shareholders ...), which often leads to delays and even interruptions of geological investigations, i.e., delays in the MSMEs' business development. That was especially pronounced during the 2008 economic crisis and the COVID-19 pandemic.

The Republic of Serbia directly finances only the essential geological explorations entrusted to the Geological Survey of Serbia for its own needs. The type and scope of these explorations also now depend on budget-allocated funds.

7. Access to technology

The Government of the Republic of Serbia has adopted the Industrial mentioned above Policy Strategy from 2021 to 2030, which contains comprehensive reform steps in the field of industrial development, aimed at enhancing the competitiveness of the domestic industry, which will make a significant contribution to a highly sustainable economic growth, according to GDP growth rate, as well as to an improved quality of life for citizens. The implementation of the Strategy, in a technological sense, will allow for raising the level of the industry and the scope of its transformation towards digitalisation and automatisisation. An increase in the scientific and technical contribution and innovative solutions and the total volume of investments in industry will be achieved while securing the necessary balance in the structure and the quality of assets.

Through the Support Programme for Small and Medium-sized Enterprises for the Procurement of New Equipment in 2021 [29], intended for micro, small and medium-sized companies, sole proprietors and cooperatives, in only six months, RSD 1,899,607,082.68 grant funding has been approved for almost 700 applications, while the investment value of the supported applications amounts to RSD 9,700,642,596.95. A total of RSD 2.05 billion (approximately EUR 17 million) has been allocated to this programme according to the following formula: 25 % in the form of a grant, 70 % in the form of highly favourable bank loans or lease, while 5 % shall be provided by the company itself.

Technology Parks (Novi Sad, Nis, Belgrade, Cacak) bring together high-tech **small and medium-sized enterprises** and represent a place of connection between institutions, science and economy.

Thanks to technology parks, small and medium-sized enterprises and sole proprietors, highly sophisticated equipment is made available in one place. At the same time, they are provided with easier access to the market of products and services of a specific type. Some of the benefits are the proximity of other actors in research and development activities and the accessibility of the latest science and technology information.

A key priority for Serbia represents boosting the economy's competitiveness, with a particular focus on innovation, entrepreneurship and **micro, small and medium-sized enterprises**. One of the essential elements of a broader startup, innovation and entrepreneurial ecosystem in Serbia are business incubators (BI). The development of this ecosystem is being made consistent with the political priorities of the Government of the Republic of Serbia. The potential of business incubators can be used to support the business operation of high-tech startups and business operation in social inclusion processes to support women entrepreneurs from underrepresented and vulnerable groups. Five business incubators were established in the early stage of business incubation development in Serbia until 2006, and currently, there are forty. Business incubators are centres aimed at supporting the creation and development of new enterprises. There are many forms of incubators. They have in common the services and professional support provided to the enterprise founder to start a business as efficiently as possible.

This kind of support covers the provision by the State and the private sector of infrastructure, financial, organisational, technical, professional and any other necessary assistance in building new business ventures. The main advantage of business incubators is that they provide services tailored to young firms.

BI clients regularly use services provided to them. As the main reason for becoming BI tenants, they emphasise increased visibility, a good working environment, and lack of management and business knowledge, as well as a suitable working space, grant received through BI assistance and support, and links with the business sector.

The two most common criteria used for selecting users in BIs are a business plan and an outstanding management team. Furthermore, for BIs providing support to high-tech startups, the decision as to whether a firm will become a BI client is also influenced by whether the company demonstrates its growth potential as well as having an innovative project.

In the light of the above, it is evident that in the current market conditions of business in Serbia, there are certainly opportunities in the mineral raw materials/natural resources sector to acquire new knowledge, both in terms of professional development (conferences, consultations, professional exchange of experience) and in terms of application of new and innovative techniques and technologies in processes and procedures of application of new and innovative methods of

geological site exploration and desk studies, as well as of the application of new forms of exploitation of mineral reserves or new environmentally friendly technological methods of mineral processing, which in today's market conditions and the business environment represents an enormous benefit, both for the individual and for all actors, in particular for MSMEs, public authorities and institutions, other economic, educational and scientific actors, faculties, etc.

Given the above, it is evident that, at this moment in time, the approach to technology, i.e. approach to entirely environmentally sound technology, may position itself at a high level and therefore be rated as acceptable.

8. Logistics and supply chains

For a supply chain, it is materials, information, equipment, financial and human resources, and the relations between companies that are important. The objective of each supply chain member is to reach maximum values. In that sense, the value for the end-user-consumer of final products is particularly significant.

Nowadays, one cannot imagine the organization of a serious company, which lacks the role of Supply Chain or Logistics Vice President within its strategic tier - management. At the same time, supply chain management cannot do without information technologies and appropriate strategic goals (development of an adequate model, long-term planning, distribution, transport...).

Therefore, logistics and CRM supply chain in MSME business are directly linked. They should use supply chain management systems or SCM systems. The need was also expressed to make it easier for managers to control relevant software and programs. Through this management system, the total costs of the supply chain are examined; level of services, software asset management, accommodation of users, inventory turnover ratio, etc.

The business life cycle of MSMEs, also in the domain of CRM, is becoming more global, complex, and fast-paced with each passing day. It is a well-known fact that nowadays a considerable amount of information that flows from various directions into one company centre gets processed very quickly by software - computers. MSMEs that perform geological CRM explorations own a database that tens of thousands of different data flow into, such as results of exploration activities, laboratory (chemical) tests, data on suppliers, customers and products. In the said supply chain, these data must be managed by applying appropriate software program packages, both on a daily and weekly or monthly basis.

MSMEs must apply appropriate SCM strategies in their business since they could very quickly lose the attained position among the competitors in the supply chain. Therefore, it is necessary to plan future activities to heal the supply chain from the consequences of the negative impact of the Coronavirus pandemic (procurement of software, proper training, raising the level of system security).

Supply chain leaders must bear in mind that the above activities have to be transparent, and in terms of technical performance and solutions, they must be optimal, flexible and acceptable.

As it stems from the facts stated above, the negative impact of the Covid - 19 pandemic on logistics and supply chains within the MSMEs and CRMs is clearly evident and measurable. The supply chain has demonstrated weakness, which manifests in the lower pace, scope, and quality of supply (CRM), employees getting infected, and therefore in the possibility of timely delivery of final products, necessary production materials, etc.

* * *

EXAMPLE: Opening a new mine (CRM) - Opportunities for MSMEs

One of the most significant greenfield investments in the mineral raw materials sector in the Republic of Serbia, which, if realized, will have a direct and indirect impact on the development of small, medium and micro-sized enterprises, is “Jadar”, the project of Rio Tinto company (Rio Sava Exploration d.o.o., Belgrade).

In 2004, the international mining company Rio Tinto started the geological exploration of evaporite minerals in the area of the Jadar River basin near Loznica in Western Serbia, during which, at the beginning of the investigation, it discovered a previously unknown mineral of boron and lithium - jadarite, which was verified in 2006 by the International Mineralogical Association. It has been determined that the mineral jadarite occurs in such a concentration and with such a content of boron and lithium that it builds a unique deposit from the world-class deposits. During the fifteen-year exploration period and by engaging many micro, small and medium-sized enterprises from Serbia and abroad in that phase, the company verified the balance ore reserves in the Jadar deposit after the end of the period of geological explorations in the amount of 158 Mt.

Currently, activities are underway to develop technical mining documentation and the Environmental Impact Assessment Study, all intending to obtain approval for the opening of the mine. Along with the relevant documentation and the corresponding Feasibility Study, a presentation of the Study on the Economic Impact of the Jadar Project by Peterhof Consulting d.o.o. from Belgrade was held in the Chamber of Commerce and Industry of Serbia (CCIS). The Study has stated that the funding in that investment would amount to 2.4 billion dollars if the Jadar project is realized. The project would contribute to gross value added in \$ 1.5 billion a year. It would directly employ 1,170 workers and indirectly another 3,959 through the engagement of small, medium and micro-sized enterprises (MSMEs) in the Republic of Serbia.

As stated in the Study, the total annual contribution of the project to the economy is estimated at 2.9 per cent of GDP, taking into account the supply chain and consumption effects. It is planned that the Jadar mine near Loznica in Serbia will produce about 58,000 tons of fine, battery-grade lithium carbonate, 160,000 tons of boric acid, and 255,000 tons of sodium sulfate, placing Rio Tinto among the top ten lithium producers in the world. It is envisaged that companies from the Republic of Serbia will carry all accompanying planning, construction, engineering, infrastructure, and other works. As stated in the Economic Study, the company's plan is to create a national value chain, which would mean that after the exploitation of lithium and boron, the orientation will not be on ore exports, but on ensuring the production of finished products in the Republic of Serbia, which would engage many small, medium and micro-sized enterprises (MSMEs). Rio Tinto's information brochure on the Jadar project contains data stating that 200 million dollars a year are planned to be spent on suppliers, considering the significant needs for materials, equipment, services from the electrical, mechanical, metal processing, chemical, transport and construction sectors. The building of a modern mine is envisaged, with all the necessary infrastructure and state-of-the-art equipment and with due respect for high environmental standards.

However, at the moment, there is great concern and opposition from environmental organisations and citizens who are protesting and opposing the Jadar project, which they believe would lead to grand-scale harmful consequences for the environment, both at the local and broader regional level. They think that there are many unknown factors regarding the exploitation of lithium and boron and fear that Rio Tinto's technologies would use to exploit boron and lithium ore - jadarite,

would not be "green" enough they would have a detrimental impact on the environment. The citizens are primarily concerned considering the environmental incident from a few years ago in that area when heavy metals poured from the tailings of the former "Stolice" antimony mine into the Kostajnička River, which flows into Jadar and then into the Drina River.

The position of the Government of the Republic of Serbia is that the mineral jadarite - jadarite ore represents a development opportunity for Serbia, but only provided strict measures to protect the environment and the will of citizens are observed. The President of Serbia declared that the state is willing to hold a referendum on the Jadar project and construct a mine for lithium exploitation in the municipalities or districts around Loznica to see if the citizens want it. Still, he also pointed out that people should know that the project would enable economic prosperity and demographic recovery. The Ministry of Mining and Energy's position is also that the Jadar project will be implemented only after completing the Environmental Impact Assessment Study and after the announced referendum, where the people will decide whether they agree with this project after considering all aspects of environmental and economic impact assessment.

Observing the Jadar project from this example, from the aspect of the application of the UNFC and UNRMS systems on the classification and management of resources in Serbia, and based on the overall available data, the following can be noted:

For the application of UNFC:

- G axis - From the aspect of confidence in the results of geological exploration of resources, by verifying the balance reserves of the Jadar deposit, it is noted that they are fully accomplished, but with the condition that the category of the highest degree of confidence (category A) is missing.
- F axis - Technical feasibility has been proven by developing mining technical documentation.
- E axis - Economic and ecological conditions have been confirmed in the economic part, while in the part of environmental protection, they have not yet been verified.

For the application of UNRMS:

- By introducing UNRMS in the system of resource management in Serbia, the Jadar project in question could be observed through the sustainable development and circular economy model for the needs of the state.

4. Summary of Guidelines and Best Practices in Critical Raw Material Supply for MSMEs and Conclusions:

1. Recommendations for MSMEs in Serbia

The business activities of MSMEs in Serbia cover critical mineral raw materials, both from primary sources (In, Ga, Ge...) and those from secondary sources, in the supply chain and within industrial use. MSMEs operated in balanced business conditions and stable business environments until the COVID-19 pandemic broke out. Still, the pandemic disrupted this environment, which mainly affected the provision of the needed amounts of critical mineral raw materials, their quality, and the availability of adequate transport and supply.

The outbreak of the COVID-19 pandemic had and continues to harm MSMEs, which is of great importance for the economy of Serbia since MSMEs constitute more than 99% of active companies. This fact alone shows that the recovery of the MSMEs sector, which has lost about a third of its income and is predominantly financed by external sources, is the key to Serbia's post-COVID-19 pandemic economic recovery.

The Government of the Republic of Serbia has put in place an economic package following the declaration of the epidemic in the country to reduce the negative effects caused by the COVID-19 pandemic and support Serbia's economy.

However, it was only an emergency measure to recover from the initial market shock that has affected all legal entities' business operations. Unfortunately, the pandemic persists, and although business gradually returns to normal (Serbia's economic growth amounts to 7.3%), the consequences of the pandemic are apparent. However, this situation can be an opportunity for MSMEs to examine the way they do business, identify advantages and disadvantages of their operation, and approach business process improvement so that, in the event of any other market disruption, they are better prepared to respond to such challenges.

Considering all the facts stated above, the following measures are suggested to be taken by MSMEs in Serbia.

1. Access to information and education

According to this recommended measure (recommendation), MSMEs should inform and educate their staff by actively involving them in available training courses and workshops that promote entrepreneurship topics. The future and the existing MSMEs in the mining sector (CRM) should pay special attention to education about green investments since surveys have shown a deficient level of awareness (only 3-5%) of the 2030 Agenda's goals among MSMEs today. **Ensuring a higher level of information provision and adequate education within MSMEs** would allow the creation of new jobs and new markets and the reduction in operating costs. Knowledge of special regulations laying down the supply chain according to international standards (ISO, customs regulations, insurance, loans...) is also of the utmost importance.

2. Digitalization in business

The pandemic showed that MSMEs, which had brought their business into line with the requirements of digital communications by establishing their own databases and had digitised their business process promptly, experienced considerably fewer adverse effects during this period. It is therefore recommended that MSMEs **digitize their operations** and thereby ensure in a rational manner their market competitiveness in response to new technological conditions.

3. Linking the MSMEs within individual sectors

To increase competitiveness, productivity, liquidity, and maintain the supply chain stability in the critical mineral raw materials sector, it is essential to link MSMEs within individual sectors in associations, clusters, etc. The vital mineral raw materials sector (geology and mining) entirely relies on the metalworking, construction, trade and transport sectors. In emergencies, the international transport sector plays a vital role, especially regarding the delivery of production materials, finished products, etc. Building links inside specific sectors increases the availability of staff and technical-technological equipment and improves information, and, from the supply chain security perspective, the associations concerned are much safer. This also allows such associated MSMEs to meet the needs of large companies and fully align their development with the demands of domestic and foreign markets.

4. Introduce Circular Economy principles in their production processes to optimize operational costs

By introducing the principles and models of the circular economy of CRM production and supply chains, MSMEs will be able to optimize operating costs while increasing their value.

2. Policy recommendations applicable for Serbia

1. Policy of the development of strategic documents

The development of strategic documents includes the **policy of an integrated method of classification and management** of critical mineral raw materials (CRMs) through the development and adoption of the Republic of Serbia Strategy for Mineral Resource and other Geological Resources Management (the document has been adopted, as a proposal, in 2010 by the RS Government, but has not entered the parliamentary procedure). There is, therefore, an urgent need for its development and adoption. This document should frame the mining policy of the Republic of Serbia, including criteria for the extraction of critical mineral raw materials, which are essential both for the Republic of Serbia and at a broader level. Moreover, the Strategy would specify the demand and supply of mineral raw materials, with due regard to all industrial, economic, environmental and social aspects and with support from applicable legislation consistent with EU recommendations and good practice.

2. Implementation of UNFC and UNRMS

The need for implementation of UNFC has been demonstrated in the national strategic document "**Development Partnership Framework for 2016-2020 between the Government of the Republic of Serbia and the United Nations Country Team**", which was jointly signed in May 2017. As a special programme priority, this document highlights support for harmonization of mineral resources data in Serbia with the United Nations Framework Classification for Resources

(UNFC), i.e. for its implementation in the mineral resources sector, and provides for the assistance by the United Nations in achieving this goal.

However, so far, there have been no activities on its implementation, so this still remains the task for the next period and the introduction of UNMRS, which has been set up in the meantime.

The introduction of these global systems would improve the classification of resources and the management of both mineral and other resources in Serbia.

The first step towards its implementation is training specialists in the mineral raw materials sector with support from UNECE-EGRM representatives. The training process may also include the neighbouring countries that use the same classification system of mineral raw materials reserves as Serbia.

3. Data digitization

Digitization of geological data obtained by earlier geological exploration should be conducted by the Geological Survey of Serbia to ensure an adequate classification and management of mineral raw materials and reserves. Particular attention should be paid to the geological exploration of mineral raw materials presented in the annual final reports and studies during the digitisation process.

4. Harmonisation of legal rules related to the supply chain (mineral raw materials)

All legal rules directly affecting the supply chain of critical mineral raw materials should be harmonised. This involves coordinating laws in geological and mining exploration, spatial planning, environmental protection, etc. There is now an overlap of competencies causing delays to administrative processes and burdening the supply chain.

5. Financial support for MSMEs

Micro, small and medium-sized enterprises need to be supported through loan financing to encourage the production, processing, and use of critical mineral raw materials (CRMs), stimulation, tax rate reduction, and improvement of customs reliefs and tariff systems for exports, e.g. finished products, concentrates, etc.

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