

## The political frame of the European Union for mining of non-energetic raw materials

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*The goal of the present applied raw material policy is to provide effective using of the domestic raw material base with regard to industrial, energetic, environmental policy, and local planning. The Slovakian raw material industry is in a breakthrough situation. Therefore, there is a task for all society to give vast effort to provide that also Slovakian raw material policy would begin to grow. In the presented contribution we search raw material policy in Slovakia from the systematic view, analyzing individual elements of the system - relations with supplier-consumer, legislative, property, personal, economic, political and other relations in the frame of the system, as well as relations with its surroundings. We made a model of new raw material policy that defines systematically and objectively conditions, goals, and measurements and tools for filling of these goals with the aim to revitalize Slovakian raw material policy. Such a model could provide sustainability of the mining industry in the country.*

**Key words:** raw material policy, mining, non-energetic raw material, economic growth, sustainability

### Introduction

The raw material policy of the state is a strategic document that defines the main goals and priorities for raw materials base using. Ministry of Economy in Slovakia is responsible for raw material policy in period minimal 20 years, as well as for its actualization. Present economic development, providing of energetic needs, state of unemployment and social development, new legislative, the strategy of sustainable using of natural sources, skills of previous research and development, and using of the raw material base, demand acceptance of new raw material policy (Cehlár and Maras, 2001).

The goal of present applied raw material policy from 2004 was to provide effective using of the domestic raw material base with regard to industrial, energetic, environmental policy, and local planning. The entrance of Slovakia to EU, using of possibilities and regarding obligation, resulting from EU membership, as well as regarding present geopolitical situation and its impacts to the national economy in Slovakia, demands a new understanding of raw material policy, its content and aim (Ministry of Economy, SR, 2003). The new policy must be conceived considerably wider – primarily it must provide raw material security for sustainable development of the country.

Therefore, except of the present support of domestic raw materials using, of course at observing of necessary balance between living environment protection and industrial needs, it must also include policy against all possible useful energetic sources for the need of the country, either sources in abroad (business policy), or in home (support of waste recycling).

One of the most important present development trends is the development of a circular economy. Application of this philosophy and principles to the conditions of raw material economy changes present narrow and isolated view to the raw materials and it brings wider and more integrated perceiving of “raw material concept” as the object of raw material industry, following and solving whole life cycle of raw materials – whole raw material flow, not only its initial period.

A very difficult task is to create adequate space for all multispectral interests in the prepared raw material policy, which should also be with regard to raw material criticality as well as sustainable development. The raw material policy is basic planed document, describing the desired behavior of the raw material industry as a whole and in this way, also all its elements.

Despite all the mentioned problems, the Slovakian raw material industry is in a breakthrough situation. Although it is at the bottom of the synopsis development, surroundings expect its future growth and competition, not sleeping, is still growing. Therefore, there is a task for all society to give vast effort to provide that also Slovakian raw material policy would begin to grow.

The goal of raw material policy should be to define priorities for Slovakian raw material industry from the view of need to provide sustainable development of national economy and society, as well as to define measurements and tools for providing of stable development of single raw material industry and its competitiveness in international level in measure, adequate to created conditions (Cavender, 1992). The goal of

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the presented contribution is, therefore, to make a system for raw material policy creation in concrete conditions of the country. The larger the system, the greater the number of factors, decisions, constraints, and risks it involves (Straka et al., 2018). Knowledge of these factors is very important not only for the development of relevant policy concepts in the country but also for the national and international benchmarking (Khouri et al., 2017).

### Literature review

Nowadays, global environmental change can no longer be excluded; it must be solved through global sustainability, in which humanity can operate safely (Rockström et al., 2009). From this view, humanity cannot transgress boundaries and sources of the planet. It could have namely influence to the society, ecology, and economy of countries.

Mining activities divide communities and countries (Gray, 2018) due to different geological, legislation, political, social, and economic conditions. Therefore analysis of mining activities must be regarded from the view of the growth economy, encouraged by government tools – together with ecological integrity (Gentry and Neil, 1984). Only by this way state can be more supporters of mining, not resister of it. State and government should participate in the decision – making process regarding conditions of mining from a legal and political perspective (Pelaudeix et al., 2017). Openness, transparency, and public participation of the state is a longstanding issue. The state must adopt such decision to public participation with the aim to prevent mining activities from harmful impact to environment, society, and economy. Therefore, also in areas of mining principles of corporate, social responsibility must be regarded (Curran, 2017). It is using the support that community would be in opposition to mining activities and on the other hand, it could support the economic development of the regions, and in this way also the state development. Also, ordinary people should participate in decision making in the context of mining and mineral extraction (Ruwhiu and Carter, 2016) due to the multi-dimensional character of mining, which demands land using, where people are living. It is also necessary to take into account that mining industry is a very specific field which is typical with many risks like capital intensity, long pre-production period, high risk, non-renewable resources and specifics associated with human resources (Rybár et al., 2005). In this context, there has to be a relation between mining companies and inhabitants by way of meaningful participation at negotiations about mining activities. It must be covered by appropriated legislative tools, providing positive economic, social, and environmental indexes. Consequently, there is a necessity to use safe methods for mining and the use of mineral resources (Straka et al., 2016).

Several authors studied why there is resistance to the mining activities, for example, Deonandan (2015). Proper legislation could decrease such resistance, drawing attention to economic development. However, within such studies, little attention is given to understanding how and which measure social movements can affect the development of mining and its environmental impacts (Bebington et al., 2008). Social movements have significant influences on forms taken by the extractive and mining industries (Colving et al., 2015). Development of the society must be done due to the mentioned by being co-produced by movements, mining companies, and other actors, in particular, the state. A very interesting model for including of state and society to decision making about mining activities with environment considering was made by Colvin et al. (2015). This conceptual model and its interpretation through the social identity approach raise several implications for the current theory, practice, and institutions involved in the wicked socio-political level.

The principle of sustainable development has become a central idea of environmental law (Frenz, 2003). This area has to be around in legal discussion and political declarations for some time, resulting in the serious legal framework, in which the mining industry can operate positively. According to the mentioned study, there is a need for future generations safeguarding. Moreover, ecological, economic, and social interests must be reconciled. This principle could imply new restrictions for the mining and energy industries (Rybár et al., 2005). The importance of legislative is obvious in mining and implementation of new technological solutions by OZE using (Horodníková et al., 2008). The effective policy of the state in the area of mining activities could solve the problem.

### Methodology

The raw material policy is a very complex document. If it is to be valid, complex, systematic and objective, it must result from whole raw of documents, accepted at European, national and regional level, and it must include a number of influences, interests, and demands. To understand the complexity of raw material policy creation, there is necessary to use knowledge and methodology from the theory of systems and to make decomposition of the problem.

From the systematic view, there is possible to consider the Slovakian raw material industry as a single system. Elements of the system present all research, mining, processing, metallurgical, recycling, education, environmental organizations, as well as state and administration institutions. Relations present various supplier-

consumer, legislative, property, personal, economic, political, and other relations in the frame of the system, as well as relations with its surroundings.

System of “Slovakian raw material industry” presents a subset in the vertical level of European and worldwide raw material industry. In horizontal level, it presents part of the Slovakian national economy. However, this system can be further divided into subsets, for example, regional, commodity, or professional subsets, etc.

Composition of the system must be understood since it corresponds with its goals composition. If to describe system behavior, there is most effective to make it through a description of the goals and to make a description of the goals through its elements. It is for that reason that real system, or its elements, always react to any external stimulus by adaptation change in necessary context for filling of its goals.

The state is the dominant element of the system “Slovakian raw material industry.” The interest of the state is to provide raw material sources in the measure, in which there would not be any obstacle for sustainable development of the society and on the other hand, the state must provide long term effective using of raw material sources (not wasting) with synergic creation of new sources. Mentioned must be done through defining rules and coordination of “other” subjects activity – through all system elements.

In the contribution, we will deal with the description of individual system elements interests, for example, interests of geologists, miners, metallurgists, recyclers, applicators of raw materials, consumers, environmentalists, politicians, etc. However, from the systematic point of view there is necessary to underline that all such interests present together one set of interest that has its very complex structure, in which some interests contradict each other, others are in antagonistic relation, some have only objective or only subjective characteristics, some are short term or long-term, resp. permanently applied. From the view of waste, we can speak about an individual or whole society interests that have various priority and support.

## Results

Providing reliable and undisturbed access to raw materials becomes a more and more important factor for EU competitiveness, and in this way, it also presents a decisive factor for the success of Lisbon partnership for growth and employment. European commission realizes this situation and therefore in November 2008 EC accepted initiative in the area of raw materials, in which target measurements are defined for providing and improvement of the access to raw materials in EU.

Initiative in the area of raw material policy is based on three pillars:

- Providing of Access to raw material at international markets at the same conditions as other competitive industrial subjects,
- Determination of proper frame conditions in the whole EU with the goal to strengthen the sustainability of raw materials supply from European sources,
- Increasing whole sources effectiveness and promotion of recycling with the goal to decrease in EU consumption of primary raw materials and relative dependence from import.

Initiative results from the knowledge of complex analysis of competitiveness in the area of non-energetic raw materials mining in EU, and it demands to integrate Access, through which correspondent policies and EU tools could act in mutual balance in the interest of availability of basic raw materials and their sustainable mining and using.

The first pillar connects active diplomacy in the area of raw materials, and it provides righteous, fluent, and secure access to raw materials. Its reaction is also the fact that the majority of European metal minerals must be imported (in 2007 there was business deficit more than 20 milliard EUR). Political dialogue with third countries, developing economies and their regional grouping, observes the principle of “common interest”. One of the important directions is the support of sustainable access to raw materials in the area of development policy, while there is mainly strengthening of dialogue with Africa and measurements, connected Africa in area of raw materials access, administration of natural sources, as well as transport infrastructure, with regard to sustainability and social responsibility.

Dependence on import threatens production sector in the EU by influences of the external market. In future years, the price of many minerals could rapidly increase due to the rapid industrialization of developing countries, for example, Brasilia, China, and India (Torries, 1997). The number of states with rich natural sources limit presently also export in favor of own domestic producers, which disadvantages the EU industry in economic competition. European Union will solve any task of unrighteous business in accord with initiative in the area of raw materials.

The second pillar is orientated to the solving of fear of industry in connection with the availability of raw material sources in EU, mainly to the correspondent regulation frame. Different regulation processes, planning, and rules, connected protection of the living environment, health and security, can limit mining or increase mining costs. At the same time, access to mining could be expensive and time-consuming, mainly in places,

where the soil is used to other activities. European Commission will, therefore, cooperate with member states at improving frame conditions, on which mining depends, with the goal to simplify and accelerate administrative processes.

The aim of the EU initiative will also be an effort to improve research and mutual change of knowledge about raw material deposits in the whole EU. One of the goals is to provide that areas with high potential of raw materials would not be without benefit. The initiative also presents support for research projects, orientated to the development of a new technique for mining, which could consequently decrease the impact on the living environment.

The goal of the third pillar is to support higher sources of effectiveness and recycling. Presently vast volume of products at the end of the life cycle is not processed further by a reliable process with the goal to obtain precious materials, mainly metals, used in top technologies, which could be recycled. From Europe, mainly waste products are exported without effective control and perspective processing. European Commission wants to cooperate with member states at improving possibilities to verify the goal of such waste export, damages decreasing in the living environment, and increasing recycling rate for waste elements. Mentioned elements of EU initiative are also illustrated in Figure 1.

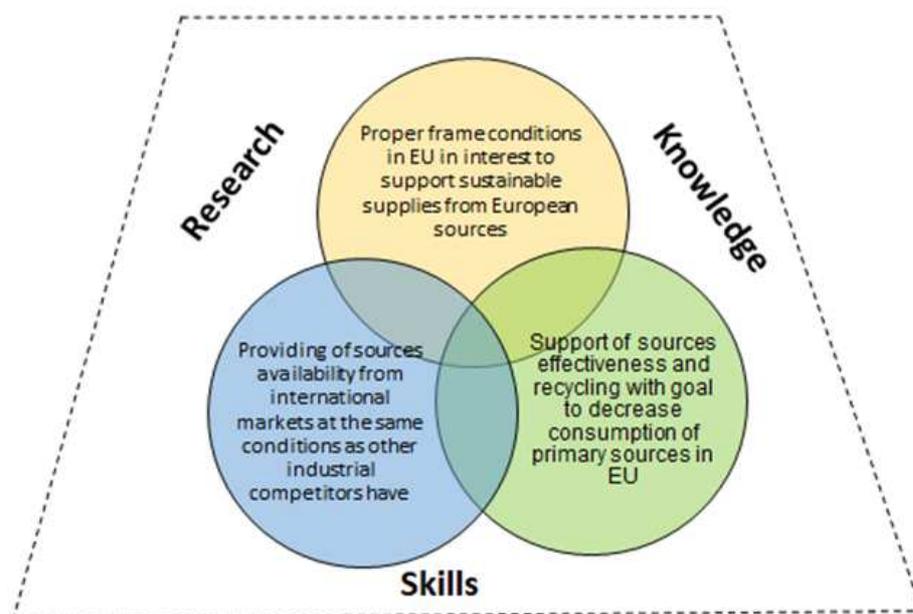


Fig. 1. Key elements of EU initiative in the area of raw materials, Source: UN, 1997.

### Indexes influencing mining of non-energetic raw materials in Europe

In connection with the second pillar of initiative in the area of raw materials, there is a limited whole raw of factors that could influence the competitiveness of European mining. They include the whole spectrum, beginning with fear, connected with diversity and complexity of processes for obtaining the allowances in individual member states, till conflicts with other possibilities of soil using, shortage of qualified working power and demands, connected living environment, health, and security. They also reflect the need of the modern technique of mining and improving knowledge about possible deposits of raw materials.

The mining industry is connected with places of known or commercially vital deposits of minerals. The appearance of minerals is conditioned by geologic activity in the past and knowledge about its structure, which depends greatly on the level of investment to geological mapping, finding, and research. The mining industry cannot be therefore acting only in areas, in which there would not be conflicts with other possibilities of soil using, with wider society, or protected areas, or areas with visual importance.

Most important is soil availability. It results partially from the characteristic of non-energetic raw materials mining. In spite the EU has many deposits of raw materials, they are not evenly distributed, and they have different quality. It is possible to mine only at places, where minerals are appearing. Moreover, not all deposits are commercially vital and decision to use concrete locality is considerably influenced by market demand, as well as by a measure of necessary initial investments and costs on raw materials transport to the final user.

Transport cost is higher the more the goods have to be transported, and they limit effectively geographical availability of such minerals.

In practice, it means that a number of quarries exist in surrounding cities, where raw materials are necessary. From a similar reason, new quarries are placed primarily in the surrounding of existing services, in spite, finally, also new spaces on „green meadow“ are searching and used. The need for Access to concrete land also means that individual development project can be in conflict with competition possibilities of land using or conflicts with wider social interests, or they can have big unacceptable influence on the living environment, although in absolute numbers the space of the land, necessary for non-energetic raw materials mining is rather low (less than 1 % of EU area). Mentioned must be following, especially in any individual case since there is very important where exactly the plan to develop mining will be realized and by what way it will be done. One of the most often mentioned problems in non-energetic raw materials mining is a problem with obtaining of new allowances with the goal to replace mined localities or to search and use new sources.

### **The base for new raw material policy creation**

The national raw material policy can be defined from the national level and European level. The differences are as follows:

The base for the elaboration of new raw material policy at the national level is to present time valid Actualization of raw material policy in Slovakia for the area of raw materials, accepted by government Decree SR No 722 from 14<sup>th</sup> July, 2004, in which raw materials were defined as a necessary condition for fluent development of the Slovakian economy.

It consisted of an analysis of domestic sources and determination of rules for protection and saving of raw materials using in accord with principles of sustainable development. The aim of actualization of the raw material policy was to determine long term goals and tools for their effective using and protection with respecting of principles of sustainable development of the society and protection of the living environment.

Demand on national raw material policy from European level: raw material policy became an inseparable part of industrial policy in EU, and at the level of individual member states it demands connection with industrial policy, innovation policy, the effectiveness of sources, living environment, and economic competition. This integrated perspective enables the industry to use necessary raw materials by the intelligent and permanent sustainable way, which contributes to strategy Europe 2020. Raw material policies at the level of member states should, therefore, include the following:

- Support of sources effectiveness, mainly primary energetic and raw material sources, by the way, to divide economic growth from growth of sources consumption,
- Strengthening of research and development with regard to critical sources replacement,
- To support existing or new mining of raw materials in such member states that are in balance with valid environmental, social and health or security legal decrees,
- To support the supply of raw material from the domestic offer, those should be one of the pillars of all measurements of raw material policy,
- To hold and increase employment in the European mining sector with providing permanent education and working power training, while the transition to sustainable mining activities should be accompanied by social dialogue at all levels,
- To make consistent policy “urban mining” (obtaining of raw materials from communal waste), which goal is to renew and make access to mentioned sources,
- To support raw material recycling and the need to provide the highest level of recycling everywhere, where it is economically and technically possible, including using of mining wastes that consist of considerable volume and spectrum of various metals.

Except mentioned EU policy as a base following European policies, directives, goals, tools, and priorities had been analyzed, as well as national policies, plans, initiatives and measurements with impact to demand of raw material industry (Tab. 1).

By comparing of basic state and identified development changes, growth factors, and demands on raw material policy, there is a conclusion there is necessary radical change of raw material policy. The new raw material policy is necessary.

Process of raw material policy creation is divided into six steps; mainly, there is necessary:

1. To define aim, vision and strategic goals – priorities of the raw material industry as an integral part of the national economy,
2. To define tactic, which means measurements and tools, by which help defined strategic goals will be achieved,
3. To define the present, mainly long term disposal and need for raw materials and their importance and use at national and EU economy,

4. To define possibilities – ways for covering raw materials needs:
  - o By purchase abroad,
  - o By mining and processing of own protected primary and secondary sources,
  - o By waste recycling – tertiary sources using,
  - o By substitution (for example metals substituted by plastics, etc.)
5. To complexly evaluate advantages, risks, and impacts of individual alternatives of raw material needs and to decide objectively about optimal alternatives,
6. To define operative measurements and tools and ways for their application with the goal to provide raw materials available for their economical consumption in the economy (company) with the best conditions.
7. The mentioned process is also illustrated by the algorithm in Figure 2.

Tab. 1. Analysed policies in EU.

<b>EU policies, directives, goals, tools, priorities with impact on raw material policy</b>
European raw material initiative
European innovation partnership and Knowledge innovation community KIC RM
Digital economy
European technological platform for sustainable raw material sources
EU policy in the area of raw materials: ERA-MIN
EU policy in the area of raw materials. Circular economy
EU tools: European Institute of Innovation and Technology (EIT)
EU tools: Horizon 2020 - SC5
Natura 2000
<b>National policies, initiatives, and tools with impact on raw material policy</b>
Government Program Statement SR
The strategy of permanent sustainable multispectral development and strengthening of competitive ability of Slovakia
Strategy for research and innovation for intelligent specialization SR
Slovakian economic policy
Energetic policy SR
Circular economy SR
Strategy Industry 4.0 SR
Digital economy – unified digital market
Environmental policy SR
Program for the waste economy in SR 2016-2020
The conception of geological research in Slovakia

Source: Natura, 2000

The raw material policy has direct relations to all three basic areas of permanently sustainable development. At the same time, three states policies – economic, social, and environmental – are orientated to these three areas of the growth (intelligent, inclusive, and sustainable). Due to this reason and for these relations, the raw material policy must be conceived by the way to direct development and activity of Slovakian raw material industry the most with regard to those three states policies. For any of these areas of sustainable development, a single strategic goal of raw material, the policy was defined. At the strategic level, it is defined for all three areas of sustainable development by valid priorities of raw material policy, as well as by vision and aim of Slovakian raw material industry. All areas, visions, goals, and priorities are included in Table 2.

Tab. 2. Areas of raw materials policy.

Policy	Economic policy	Social policy	Environmental policy
Principles of sustainable development	Intelligent growth	Inclusive growth	Sustainable growth
The strategic goal of raw material policy	Creation of economy, based on innovation and knowledge and righteous economic competition	Support of economy with a high measure of employment that will provide social and local development and coherence	Support of more ecological and competitive economy that will use raw materials more effectively
Aim	Long term, secure and economically and environmentally effective, providing raw materials for the need for sustainable and multispectral development of Slovakia and its regions.		
Vision	The prosperity of Slovakian raw material industry, achieved by effective using mainly of the domestic raw material base in accord with economic, social and environmental policy of the state, national historical, natural and cultural values and multispectral regional development.		
Priority I.	Providing raw material security of the state in accord with state economic, social, and environmental policy according to the needs of sustainable multispectral development of Slovakia and its regions.		
Priority II.	Sustainable multispectral development of Slovakia and its regions.		
Priority III.	Transition from raw material chain to raw material flow in accord with the circular economy.		

Source: UN, 1997

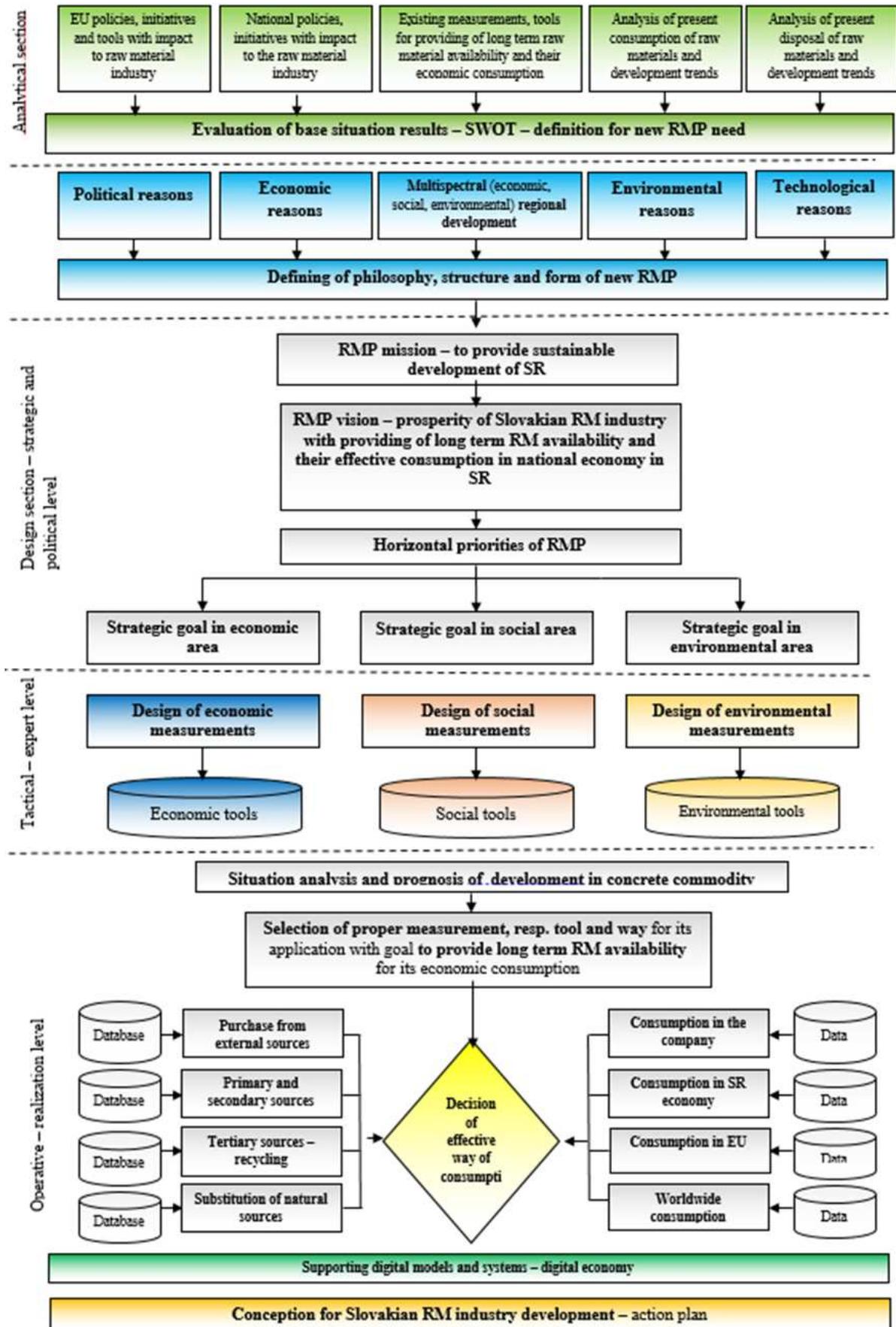


Fig. 2. Algorithm for raw material policy creation.

Except for mentioned three state policies, the raw material policy has direct connection also to the European policy, in which energetic, raw materials and the way for their providing is solved. Importance of using domestic raw materials is also emphasized in other national policies. It is part of government program declaration in Slovakia, the strategy of sustainable multispectral development and strengthening of Slovakian competitiveness, strategy for research and innovation for the intelligent specialization of Slovakia, strategy for the building of circular and digital economy, strategy Industry 4.0, and program of the waste economy in Slovakia and other policies and documents.

### Conclusion

Proper geopolitical and market conditions present a unique historical chance to revitalize the Slovakian raw material industry. Suggested concept of new raw material policy defines systematically and objectively conditions, development goals, as well as concrete steps (measurements and tools) for filling of these goals. Realization of such a suggestion can be an example of effective management and targeted support of development in the concrete industrial sector.

Detail elaboration of all tasks, connected with raw material policy, exceeds the scope of this contribution. Similarly as all development activities, also mining of non-energetic minerals must find a balance between its goals and goals of other economic interests, as well as with natural environment and wider social interests, with the aim to provide sustainability of mining operation.

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