

Lithuanian mineral resources and their usage: today, future, and problems

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Mineral resources have been, are now, and will be one of the main factors of the economic and social progress of our societies. The 20th century was the century of practically global industrialization, unprecedented consumption of subsurface resources, and impact on the environment. Society cannot survive without using natural resources, therefore their extraction is inevitable. Satisfaction of the demand for mineral resources and the impacts of extracting minerals on the environment are of increasing public concern. In accordance with the spirit of the Rio Declaration, many countries in the world are now committing to the concepts of sustainable development (based on three dimensions – economy, environment, and needs of society) and have taken initiatives to reconsider their national mineral resource management policy and to harmonize it with this conception. The sustainable management of mineral resources implies: sound geological knowledge; implementing the international policy and measures, harmonization of national legislation concerning access to mineral extraction and globalization of the resource market, irrespective of world's political and state arrangement; proper implementation and strict enforcement of legislation; preparation of regional sustainable development plans, development of strategies at regional and transnational levels; and providing educational awareness of the problems of living and working in environmentally sensitive areas; sharing the experience of mining industry (which operates under strict environmental requirements); communicating with the local community (bridge from emotion to knowledge). Much effort has been made in the fields of research, legislation, and education, however much work remains to be done. Due to the lack of objective and neutral information, the extractive industry

is often approached negatively, therefore it is important to change this picture.

The subsurface of Lithuania hides a considerable amount of mineral reserves, mainly construction mineral materials or raw materials for their production (Gasiūnienė 1998). However, by the amount of their extraction and consumption as well as their value in the world, they are the most significant and main mineral resources (after energy resources). The most important mineral resources explored at the expense of the state budget in the period of 1940–1990 provided a reliable basis for mineral commodities in the country. In the meantime, only as much as 55% of earlier explored mineral deposits are under operation, whereas the rest of them are out of use (RP 2002).

In Lithuania, 17 kinds of mineral reserves/resources have been explored to various degree of detail. Nine of these (limestone, dolomite, sand, gravel, clay, chalky marl, peat, sapropel, and oil) are under exploitation, and the exploitation of gaize (opoka) was suspended in the 1990s.

Changes in the national economy during the last two decades have altered the policy of the investigation of mineral resources so that only initial investigation is financed from the state budget, while the prospecting and exploration of usual mineral resources are financed by the customer, with the exception of the works related to the prospecting and exploration of new oil deposits, which are partly covered from the state budget. During the last decade the market laws have forced the enterprises to explore at their own expense new deposits located nearer to the user with the purpose of reducing the transportation costs.

According to the legal acts, only the reserves explored in detail can be used. Permission for the utilization of

mineral resources and cavities can be given to legal entities by the Government of the Republic of Lithuania or by the Geological Survey, depending on the kind of resources, their quantity and potential impact on the subsurface status of other states. Currently, the permits (licenses) to consume underground reserves in 375 mineral deposits have been issued to 229 enterprises (GSV 2002).

Owing to significant changes in the construction sector, increased import of the construction materials, growing prices of energy resources, lack of funds for modernization of energy-consuming technologies, increased transportation expenses, decrease in local demand, and limited possibilities of the external market, the extraction of mineral resources decreased by over seven times in the period of 1990–1996, but increased insignificantly and became stabilized later. From 2001 the extraction of main kinds of mineral resources has increased permanently. In 2006 the total amount of extracted hard mineral commodities made up 11.1 million cubic metres, of peat – 0.4 million tonnes, of oil – 0.2 million tonnes. The extraction and reclamation of the damaged areas are carried out according to the project of use. Today, 22 200 ha of land (0.34% of the Lithuanian territory) is assigned to enterprises for the extraction of mineral resources, of which the land for peat production makes up the largest part. About 13 600 ha (0.2% of the Lithuanian territory) has been damaged by mining.

At the present time the interests of the state (and enterprises) and landowners often conflict as to the use of mineral deposits. In the nearest future the negative outcome of this process can affect the development of state economy, therefore harmonization of the legal basis is required.

All mineral commodities, with the exception of oil, are mined only in open-pit mines and quarries. The depth of gravel, sand, clay, peat, and dolomite quarries usually amounts to 6–12 m, that of limestone and opoka (gaize) – up to 15–20 m, only the deepest quarry where Triassic clay is extracted is as much as 50 m deep. The thickness of the overburden in all quarries ranges from 0.5 m to 10 m. The overburden, useful mineral resources, and tailings all constitute the rocks of our daily living

environment, inert from the chemical point of view. Usually overburden rocks and tailings are utilized for reclamation of the excavated area (excavation void), therefore there are no mining waste facilities, with the exception of only waste heaps in 2–3 quarries. The groundwater level has lowered due to self flowing or pumping up in several quarries only (peat, limestone, dolomite, sand). So, in Lithuania there are no “hot spots” associated with quarrying activity. Only the abstraction of groundwater from limestone and dolomite quarries, and the technology of the extraction (explosions) could be classified as factors causing some adverse impact on the environment. These impacts are monitored by enterprises according to groundwater monitoring programmes.

Though deposits of solid mineral resources in Lithuania often have different geological structure and are found in different natural conditions, the mining poses relatively small threat to the stability and integrity of geosystems. The impact is most often short-term and can be compensated by rational and effective reclamation, which sometimes can even improve the quality of the environment.

Depending on the geological structure, Lithuanian regions are unevenly provided with the main mineral reserves/resources. The problem of possible depletion of many mineral resources will not be urgent to us and our descendants, because these resources will last for some centuries, except for low-decomposed peat, Devonian clay, monomineral quartz sand and, of course, oil (resources that will last for less than 100 years are considered as depleted ones).

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