



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Economic impact of Estonia's geological information and future plans

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Overview of the presentation

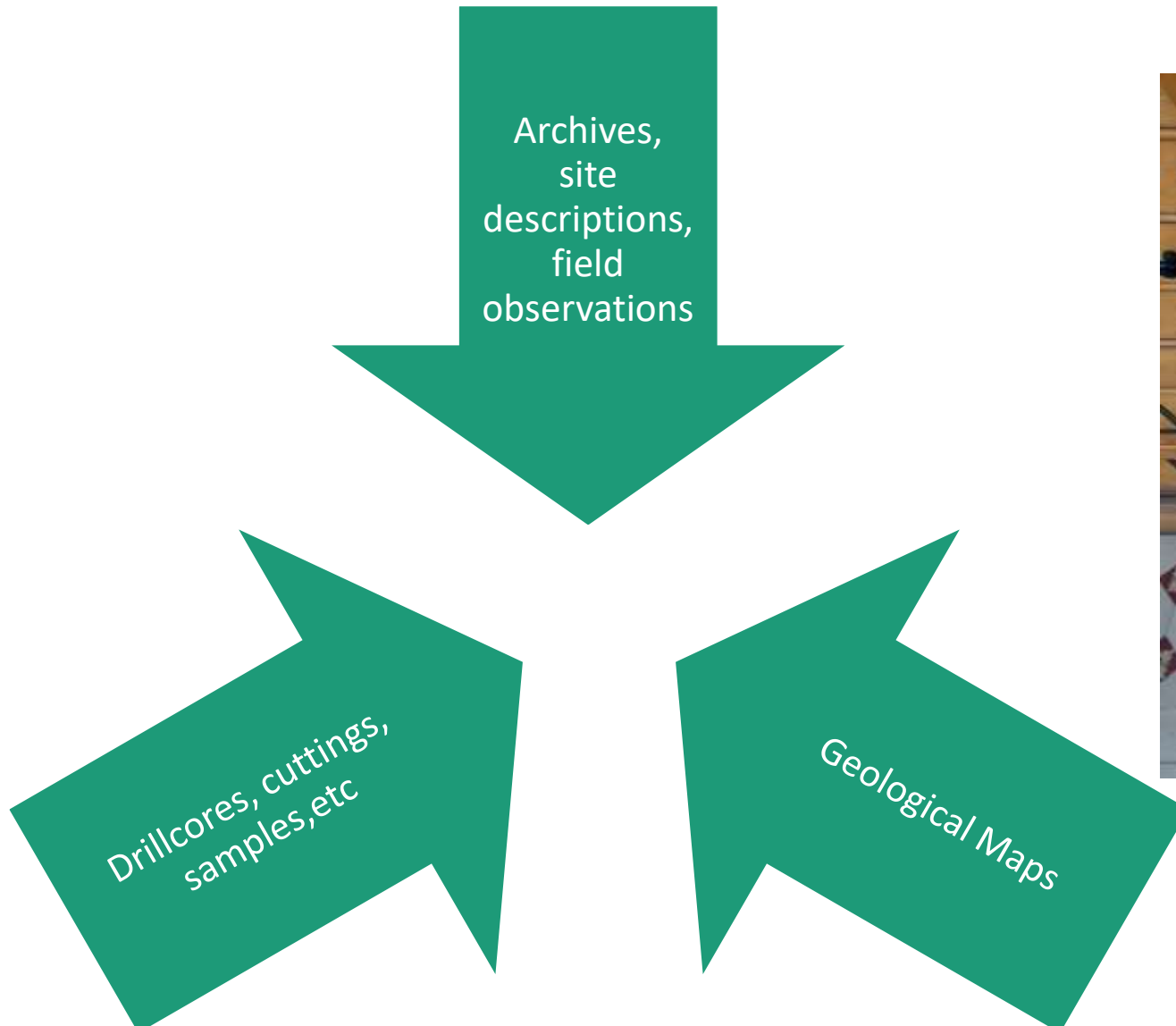
1. Geological Information in general
2. Geological information – links with other areas
3. Geological information in Estonia – current state
4. Future plans and trends

Geological Information in General

- **Earth science** empowers us to think globally and act locally – to make sound decisions about issues **important** in our lives as individuals and citizens.

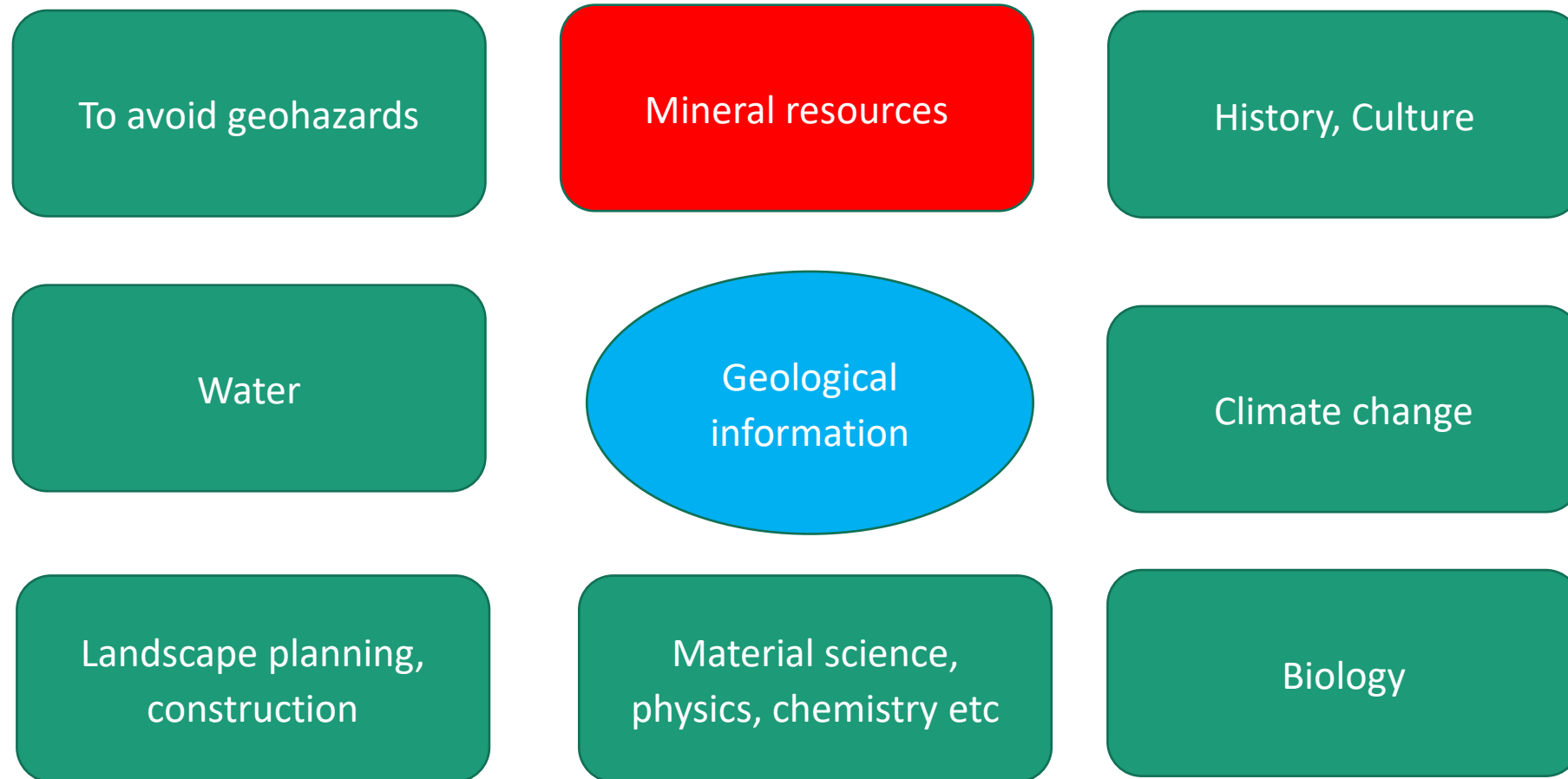


Geological information in general



Source: <https://natarc.ut.ee/en/geokogud.php>

Geological information – who are using and why?



Geological information – practical use

- Geological knowledge not only is important **because of the science in itself but has a multitude of practical approaches**: the exploration of natural resources (ores, oil and gas, water, ...), the understanding and prediction of natural disasters (earthquakes and tsunamis, volcano eruptions, ...) and so on.



Geological information - practical use

- Except oil shale research and industry, in independent Estonia, up to 2018 the research and exploration of Estonian mineral resources was carried out by private sector mostly without any governmental support.
- Estonian private sector (mainly construction sector) has invested into geological research millions of euros. That huge amount of money did not brought direct income to the society and state. That kind of „partnership“ impeded economic growth, caused distrust in society and hampered the possible valorization of mineral resources
- Situation started to change in 2016-2018, when the research programs NATARC, RITA and later RESTA were launched and universities received significant support from Estonian Research Agency for establishment of infrastructure and Mineral Resources research.
- In 2017 General Principles on Earth' Crust Policy until 2050 were adapted 06.06.
- In 2018 Geological Survey of Estonia was (re)established under Ministry of Economic Affairs and Communication

Oil –Shale and Estonia

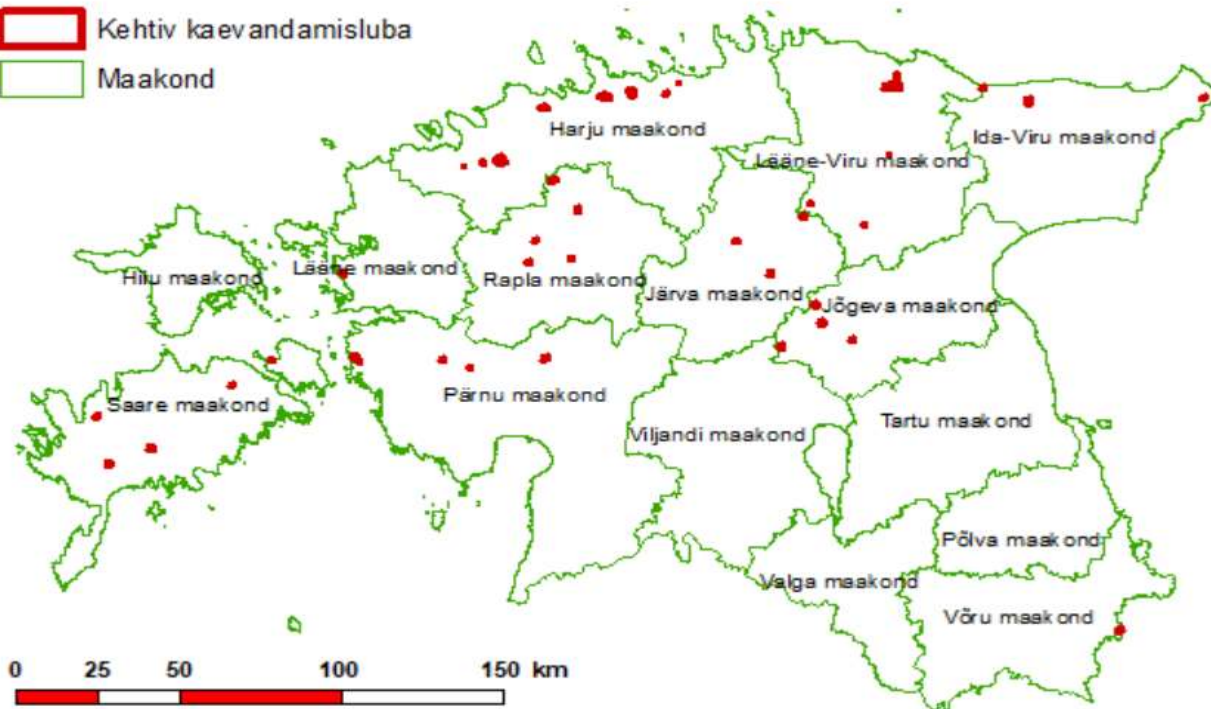
- Oil Shale is still Estonia's prime mineral resource. Oil shale is deposited in a single economic layer with thickness of 2,5 to 3 meters in depth of 7 to 100 meters in area of 2700 km².
- Only one big state owned company for mining of mineral resources in Estonia and it is the company who mines oil-shale
- Mining activity started in 1916, peaked in 1980 and is ending in next 20 years.
- The oil shale industry contributes 4–5% of the Estonian GDP and contributes about 300 million euros annually to the state budget.



Geological exploration of mineral resources for construction (limestone and sand, gravel) is carried out by private sector

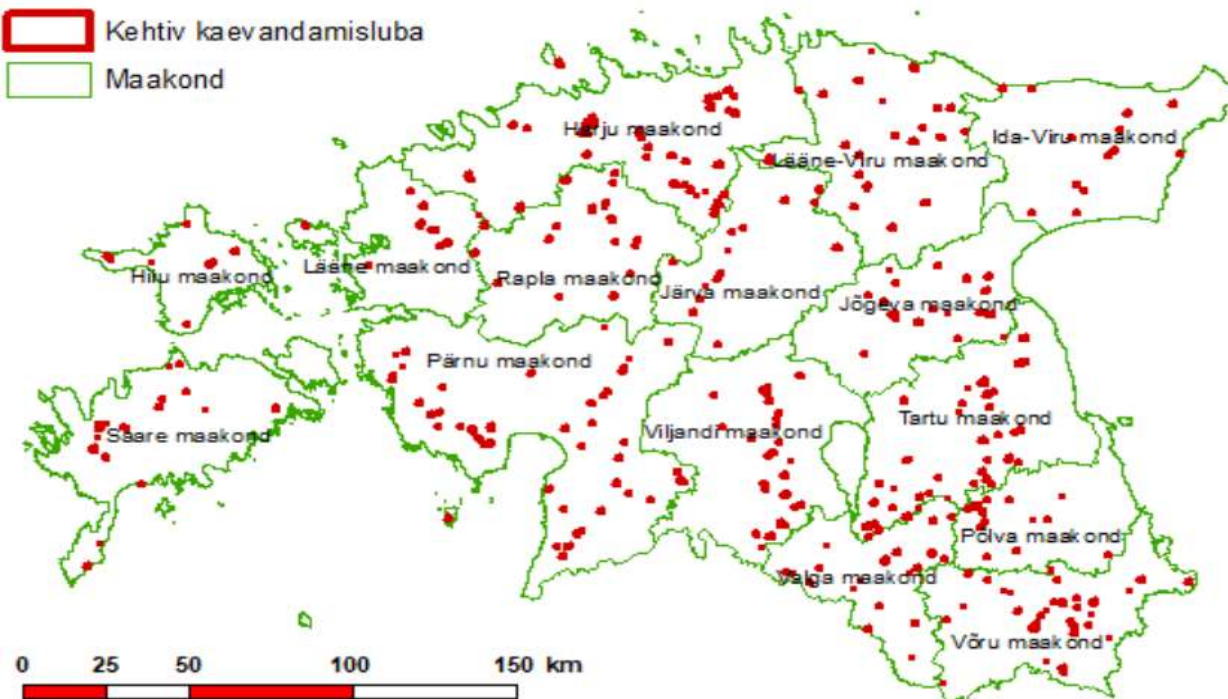
Legend

- Kehtiv kaevandamisluuba
- Maakond

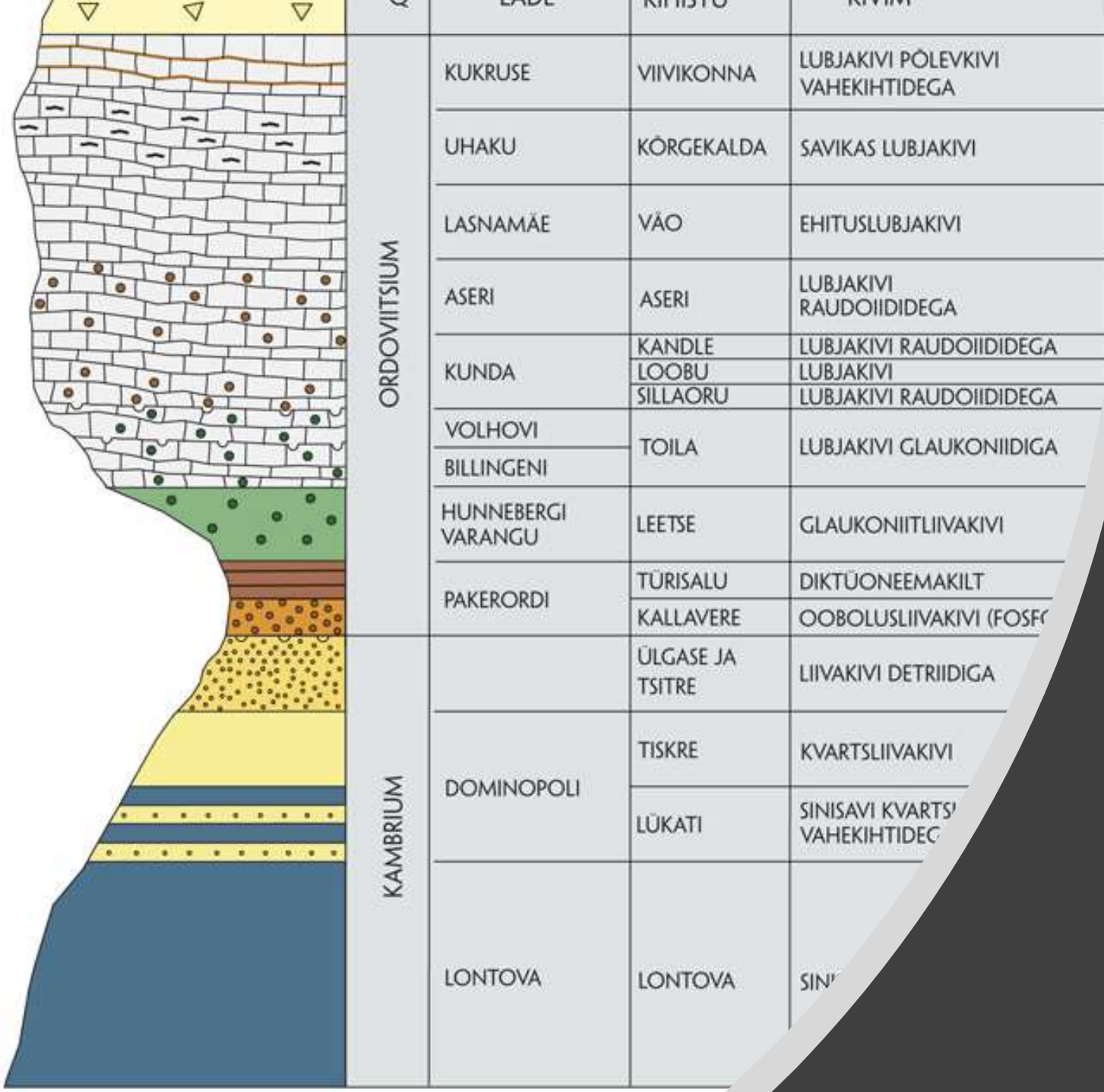


Legend

- Kehtiv kaevandamisluuba
- Maakond



2022: 82 limestone and dolomite about 540 sand and gravel quarries



Geological information in Estonia

Geological Survey of Estonia - collecting information at national level

- Most geological surveys were founded with the primary objective of collecting information concerning mineral resources and deposits.
- In 1937, the Geological Committee of Estonia was founded. After the occupation and incorporation of Estonia into the Soviet Union, the most prominent geologists and a lot of promising young scientists left homeland and a new generation of geologists was trained.
- In 1947, the Institute of Geology of the Estonian Academy of Sciences was established
- In 1957 the Geological Survey of Estonia was founded. Both these institutions developed into important centres for geological, geophysical and environmental research in the northwestern portion of the Soviet Union and neighbouring countries.
- From 1991-2017 Estonian Geological Survey was reorganised to state owned business company
- 2018 Estonian Geological Survey was re-established under Ministry of Economy and Communications

Geological collections at national level

- SARV - Geological collections in universities – very well documented and user-friendly system - was supported by research project NATARC.
- GEA _Geological Survey of Estonia – archives, geological mapping, boreholes, sampling
- GEOPORTAL_ Estonian Land Board - visualization of geological maps and data, public services
- Etc, KOTKAS, EELIS

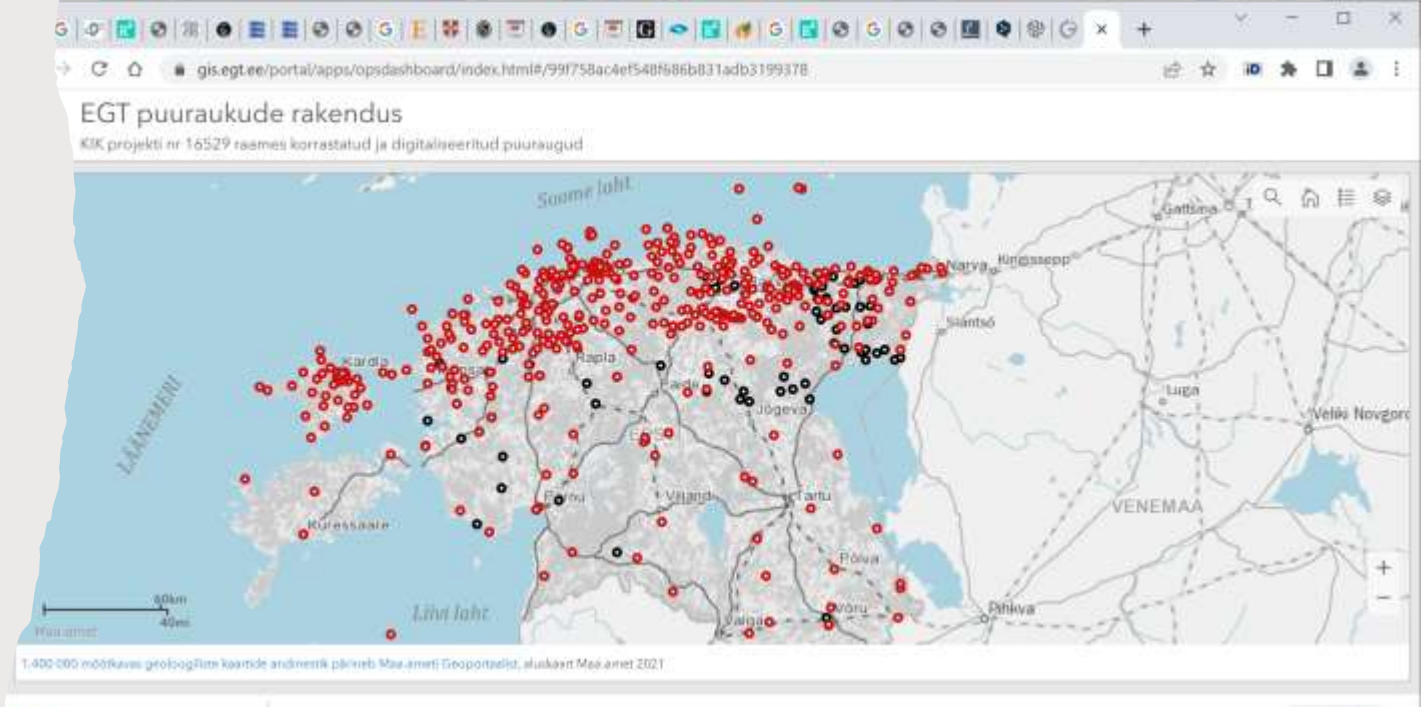


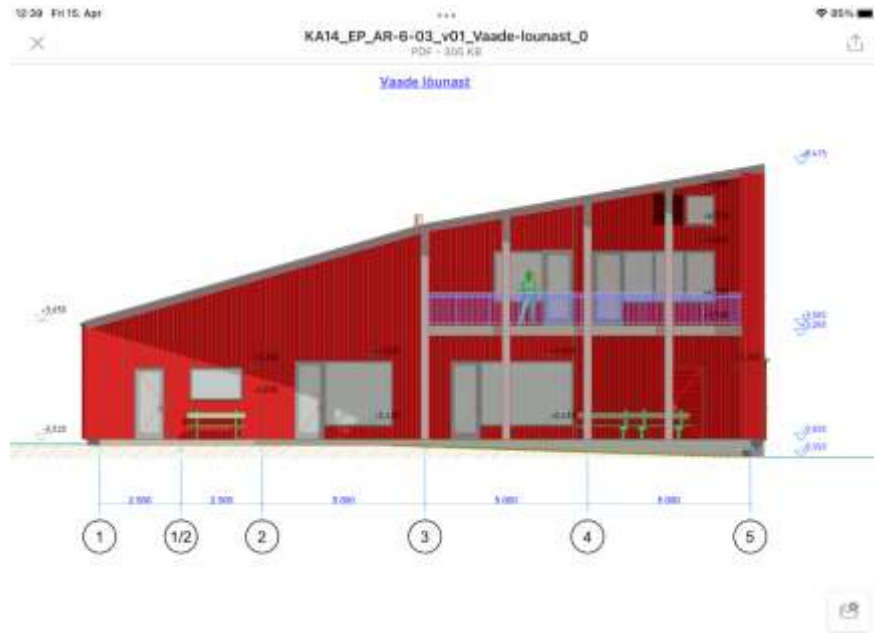
SARV

- Data is managed in joint database of geoscience collections, SARV. An estimated 310 000 records of samples and ca 80 000 images as well as other media files have been recorded in the database (in 2015). These are accessible via the portal of geoscience collections and the portal of fossils..
- SARV offers the partners of NATARC the means to store and manage data using desktop-based and web-based applications. For everyone else most of the data kept in the information system is accessible through public web interfaces. Most important of these are: (1) the portal of Estonian geological collections and its institution-based subdivisions, (2) the register of fossil taxa and (3) the portal of analytical data of bedrock.
- Drill-cores of Taltech are located in Särghaua field station

GEA and Arbavere Research Center

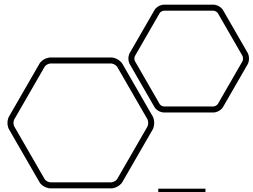
- The Estonian Geological Archive GEA is a unique digital dataset. The archive, originally founded in 1957, contains the results of geological investigations carried out in Estonia. The oldest reports in the archive originate from the year 1923. The mission of the archive is to store the geological reports collected throughout the years, maintain a database and ensure public use of the data.
- All material that formerly existed on paper can be found in the now opened digital geological archive. The searching system of public service of the archive allows one to find geological research reports with location information and other accompanying material, and if desired, to download them.
- Arbavere Research Centre connects drill-core storages and special equipment and facilities for studying them. Estonian Geological Survey holds all state own drill cores – altogether about 26 thousand boxes or 120 thousands meters of core.





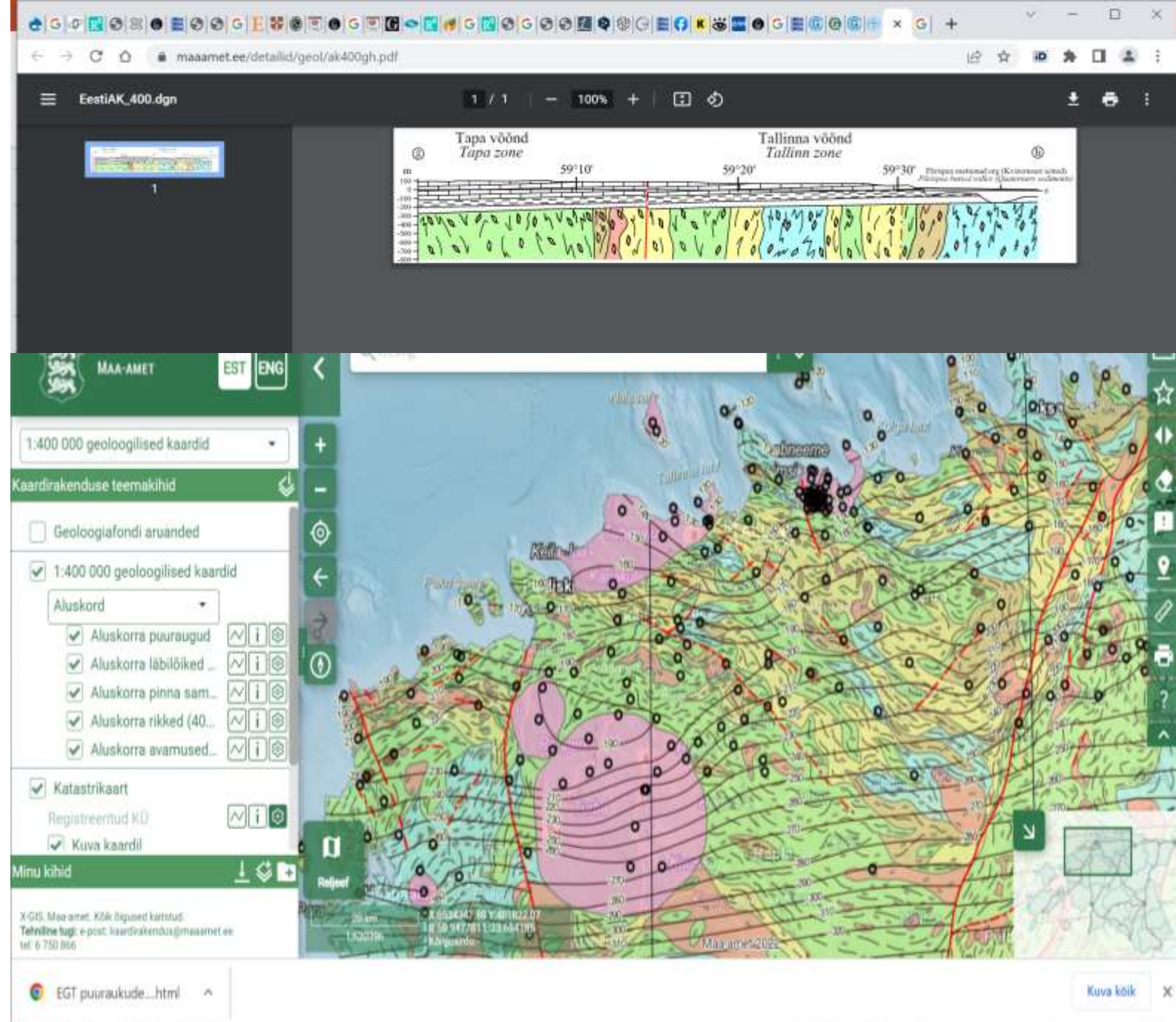
Arbavere Research Centre

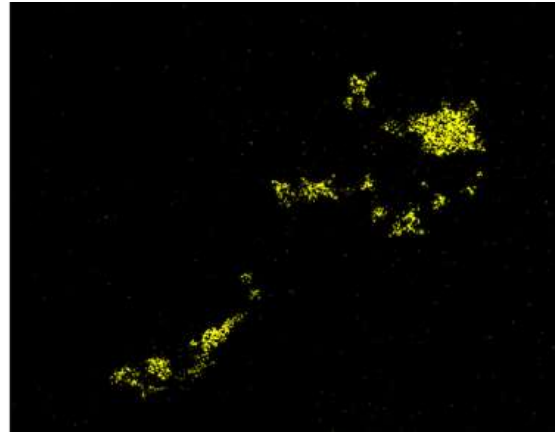
Under construction...Before and after....



Estonian Land Board

- The Land Board's Geoportal provides descriptions of our spatial data and services, access to different map applications and information on the use of spatial data.
- Geological maps in scale 1:400000 and 1:50000 are available.





Future plans and trends

- Secure major national development projects with geological information – challenge create technological and economical competence for possible use of most promising mineral resources
- Develop EGS information systems GEA and achieve that all Survey's geological and spatial data can be used from one central database. Create links to other systems (SARV, EELIS, MAARDLATE nimistu).
- Get more detail data from existing drillcores (REEs in Phosphorite deposits; Crystalline basement).
- More and more work with societies to gain social acceptance

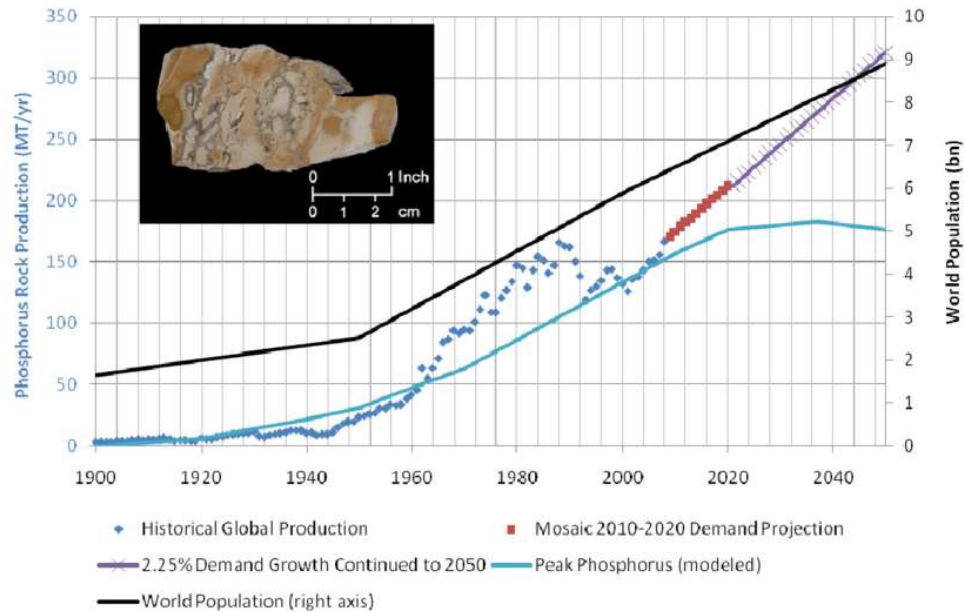
Need to analyse whole value chain!



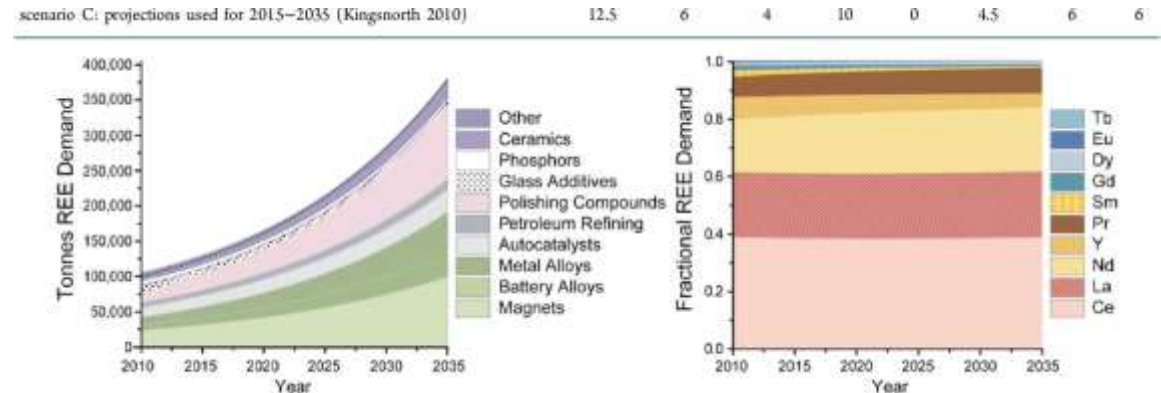
Whether Estonia has a place in the world 's mineral economy?

Modern society is totally dependent upon access to raw materials. Access to affordable materials is essential for the effective functioning of the World's economy.

Will Phosphorus Rock Production Keep Up With Demand?



scenario C: projections used for 2015–2035 (Kingsnorth 2010)



A stack of four smooth, grey stones is balanced vertically on a beach. The stones vary in shape and size, with the top one being the smallest and the bottom one being the largest. The background is a blurred green landscape, and the foreground is a rocky beach.

Extraction
and **valorisation** of
European metal
and **mineral** sources are
vital to securing access
to metals and minerals
produced in a sustainable
manner.

**Good Geological
Information is
precondition of all that.**

Earth science empowers us to think globally and act locally – to make sound decisions about issues **important** in our lives as individuals and citizens.





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Thank you!

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