Minerals, metals and mining statistics: The role of Geological Surveys in building continental-scale official data sets
EuroGeoSurveys

37 Geological Surveys

Albania, Austria, Belgium, Bosnia & Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, FYROM, Germany, Greece, Hungary, Iceland, Italy, Kosovo, Latvia, Lithuania, Luxembourg, The Netherlands, Malta, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

Geological global scale cooperation

EuroGeoSurveys - The Geological Surveys of Europe
In fact… it’s all about **GEOLOGY**

**The European Union non-ferrous metals manufacturing industry:**

Accounted for 1.25% of EU manufacturing in 2010. Its turnover reaches EUR 120 billion (1.8%). The sector directly employs more than 500 000 people. The average size of the companies is contingent on the stage in the production process, with mainly large players for smelting, but many more SMEs for rolling, extruding and recycling. Large-scale concentration has not taken place in the secondary production of non-ferrous metals. Regarding the demand side, the EU is one of the biggest consumers of non-ferrous metals worldwide.
EGS Strategic Vision: towards a European Geological Service
EGS Strategic Vision: towards a European Geological Service

EuroGeoSurveys - The Geological Surveys of Europe

GeoERA
KICK-OFF MEETING
17-18 JANUARY 2017 | UTRECHT, NETHERLANDS
AT THE GEOLOGICAL SURVEY OF THE NETHERLANDS
### GEO-ERA

The European geoscientific research network

<table>
<thead>
<tr>
<th>THEME</th>
<th>BUDGET* (EUR million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme 1: Geo-Energy</strong></td>
<td>10,2 (~85% of 12 million)</td>
</tr>
<tr>
<td><strong>Theme 2: Groundwater</strong></td>
<td>7,6 (~85% of 9 million)</td>
</tr>
<tr>
<td><strong>Theme 3: Mineral Resources</strong></td>
<td>8,3 (~92,5% of 9 million)</td>
</tr>
<tr>
<td><strong>Theme 4: Information Platform</strong></td>
<td>3,9 (~13% of 30 million)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30 million euro (~33Mio USD)</td>
</tr>
</tbody>
</table>

#### EGS Strategic Vision: towards a European Geological Service

[Image of EGS Strategic Vision diagram]

---

* EuroGeoSurveys - The Geological Surveys of Europe
Unique pan-European datasets (mineral resources)

http://www.minerals4eu.eu/

EuroGeoSurveys - The Geological Surveys of Europe
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 641999.

The ProSUM Project

“I am useful”

EuroGeoSurveys - The Geological Surveys of Europe
**ProSUM Objectives**

**Coordinate** with a wide range of organisations involved to improve the knowledge base on CRMs in secondary sources

**Collect**, describe and compile currently available data and trends for CRMs

**Collate** and harmonise existing data and develop a sampling strategy to model historic and future stocks of CRMs

**Construct** the EU-UMKDP as the Inventory and Portal providing state-of-the-art data for the four waste groups

**Communicate** and disseminate results and recommendations to support full access to CRM information

---

**Mining Wastes**

Nassar et al., 2015

http://advances.sciencemag.org/content/1/3/ea1409180.full
Primary Versus Secondary Stocks

Primary deposits

\[ = 9 \text{ g Au} / \text{t}^* \]

Secondary deposits

\[ = 280 \text{ g Au} / \text{t} \text{ mobile phone (x30)} = 1'400 \text{ g Au} / \text{t} \text{ PWB (x150)} \]

* highest mass fractions in Kloof gold mine in South Africa

Future Demand Scenarios

<table>
<thead>
<tr>
<th>Global Demand 2006</th>
<th>Global Demand 2030</th>
<th>in brackets: ratio between demand and world annual production 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallium 28 t (0.18)</td>
<td>x 22 603 t (3.97)</td>
<td>Thin film photovoltaics, high performance microchips, WLED</td>
</tr>
<tr>
<td>Indium 234 t (0.40)</td>
<td>x 8 1911 t (2.29)</td>
<td>Displays, thin film photovoltaics</td>
</tr>
<tr>
<td>Neodymium 4'000 t (0.23)</td>
<td>x 7 27'800 t (1.66)</td>
<td>Permanent magnets, laser technology</td>
</tr>
<tr>
<td>Tantalum 551 t (0.40)</td>
<td>x 3 1410 t (1.02)</td>
<td>Microelectronic capacitors, medical technology</td>
</tr>
</tbody>
</table>

EuroGeoSurveys - The Geological Surveys of Europe
117 Anthropogenic concentration sites

Mineral resources potential

Primary resources

Secondary resources

St. Philip
ProSUM Consortium

Critical mineral raw materials from anthropogenic concentrations
V 1.0 is here!

http://www.europe-geology.eu
Mineral occurrences

Mineral occurrences: gold
Off shore geology: aggregates

Aquifers

EuroGeoSurveys - The Geological Surveys of Europe
There is now a home for pan-European geological datasets and services from past and coming projects.

Data from 13 projects and from thousands of national datasets are already available on a common platform with more than 600 data layers, covering Energy, Groundwater, Mineral Resources, Geohazards and Soil, but many others are not yet there.
INTERNATIONAL COOPERATION
A 25 millions euro (28 millions USD) EGS-OAGS project has started
LAUNCHED AT IGC35 ON 29TH AUGUST 2016

Special Symposium:
PanAfGeo: a major initiative to strengthen the geoscientific public sector in Africa

LATIN AMERICA
Joint EGS-AGSMI General Meeting – October 2015
Another small thing going to grow big?
FORAM

The largest collaborative effort for raw materials strategy cooperation on a global level so far

FORAM is developing and setting up an EU-based platform of international experts and stakeholders that will advance the idea of a World Forum on Raw Materials and enhance the international cooperation on raw material policies and investments.

FORAM will contribute to:
• a more joint and coherent approach towards raw materials policies and investments worldwide
• make the current complex maze of existing raw material related initiatives more effective
• fair and sustainable access to primary and secondary raw materials worldwide to maximize resource-efficiency and circularity.
### ADVISORY BOARD

<table>
<thead>
<tr>
<th>Organization</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Association of Ibero-American Geological and Mining Surveys (ASGMI)</td>
<td>European Institute of Innovation &amp; Technology / KIC Raw Materials (EIT)</td>
</tr>
<tr>
<td>Committee for Mineral Reserves International Reporting Standards (CRIRSCO)</td>
<td>Organisation of African Geological Surveys (OAGS)</td>
</tr>
<tr>
<td>Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP)</td>
<td>United States Geological Survey (USGS)</td>
</tr>
<tr>
<td>Department of Science and Technology, International Cooperation and Resources, South Africa (DST)</td>
<td>Waste Electrical and Electronic Equipment Forum (WEEE)</td>
</tr>
<tr>
<td>Ellen MacArthur Foundation (EMAF)</td>
<td>World Materials Forum (WMF)</td>
</tr>
<tr>
<td>European Technology Platform on Sustainable Mineral Resources (ETP SMR)</td>
<td>Yale School of Forestry &amp; Environmental Studies (Yale)</td>
</tr>
<tr>
<td>European Commission - DG Joint Research Centre (DG JRC)</td>
<td>UN Economic Commission for Europe - Expert Group on Resources Classification (UNECE EGRC)</td>
</tr>
<tr>
<td></td>
<td>Institute for Global Environmental Strategies</td>
</tr>
</tbody>
</table>

Although EGS is advancing at high speed, alone it won’t go far... Therefore, effective cooperation with the Study Groups is much welcome.
THANK YOU FOR YOUR ATTENTION!