



REMIX

Interreg Europe



European Union
European Regional
Development Fund

Review of cross-border collaboration between
Saxony and the Czech Republic within the framework
of the Saxon Raw Materials Strategy and
the EU Raw Materials Initiative and
Saxon efforts on smart and green mining

Saxon Efforts: Setting the Scene



Sächsisches Rohstoffkataster der Spat- und Erzvorkommen

Stand Oktober 2008



Mit Unterstützung des Sächsischen Staatsministeriums
für Wirtschaft und Arbeit



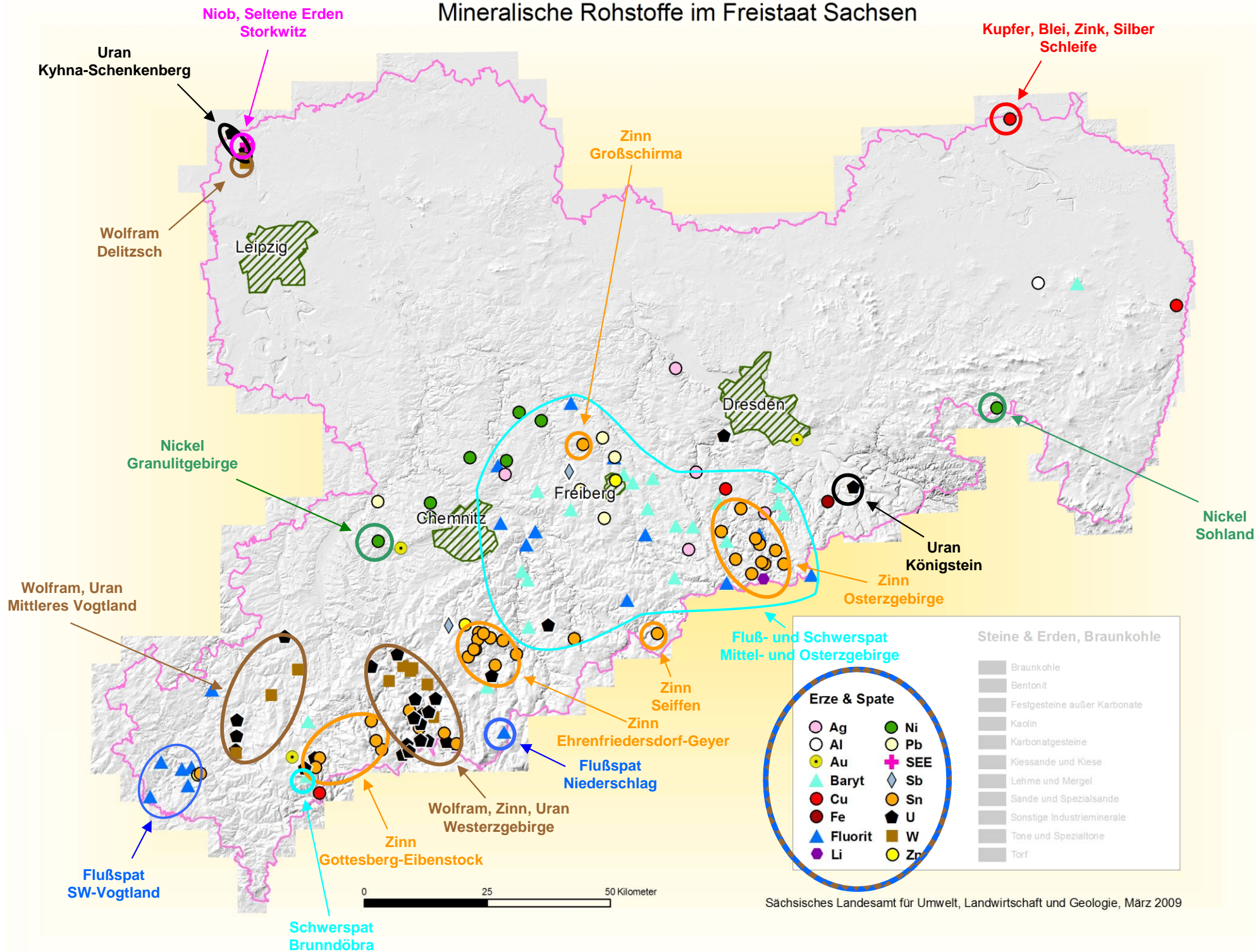
2006 – ROHSA1

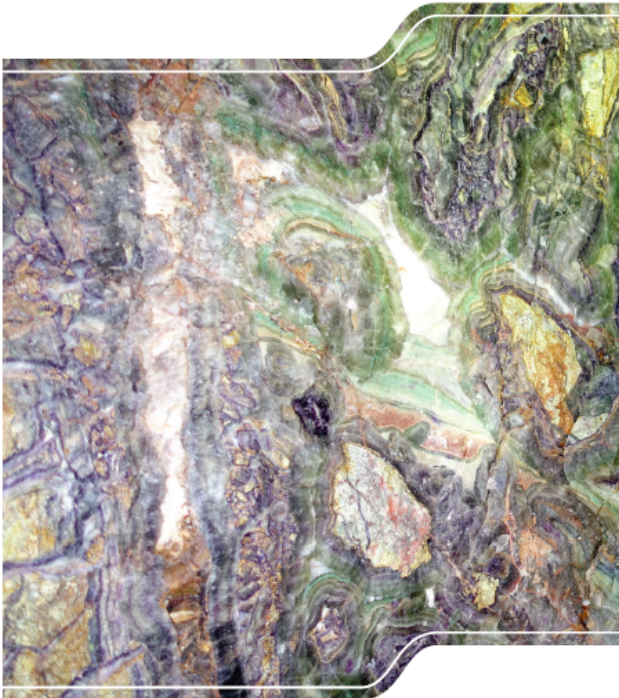
2008 – ROHSA2 - Raw Materials

Cadastre of Saxon Ores and Spars

- 139 files on spar and ore occurrences
- Intro into mining in Saxony, potential
- Merging archive data sets of different locations from industry, academia, administration to briefly outline the economic raw material potential of Saxony in terms of mine development

Mineralische Rohstoffe im Freistaat Sachsen



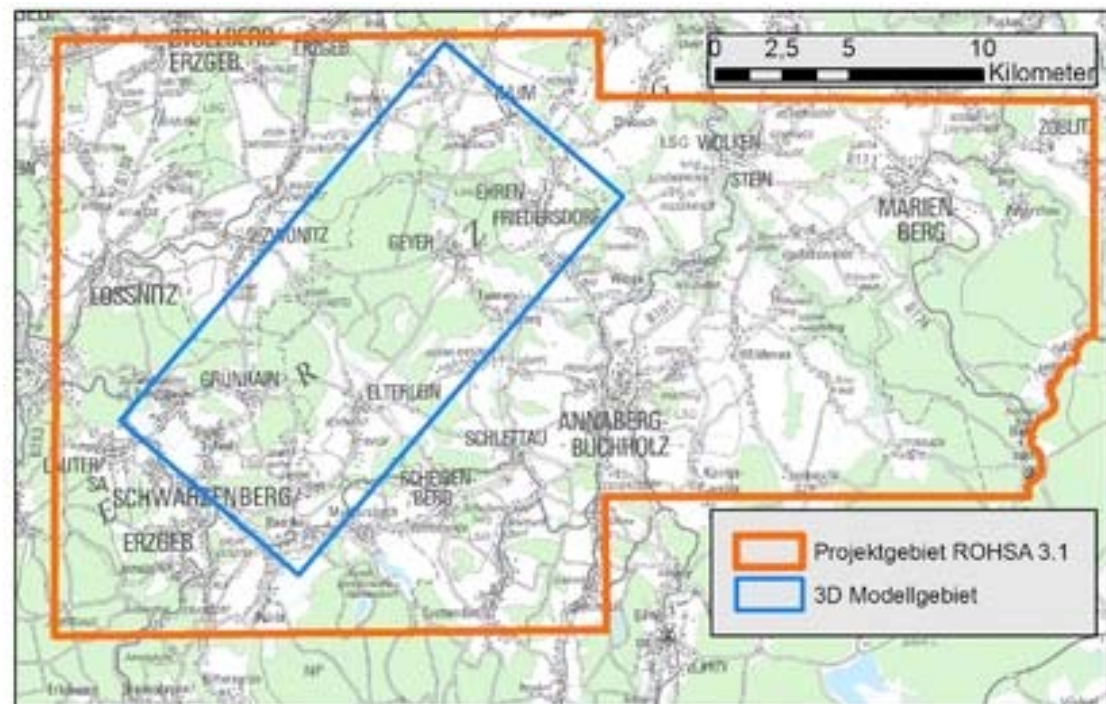


2015 ROHSA 3.1

Assessment of more than 6.400 metadata sets

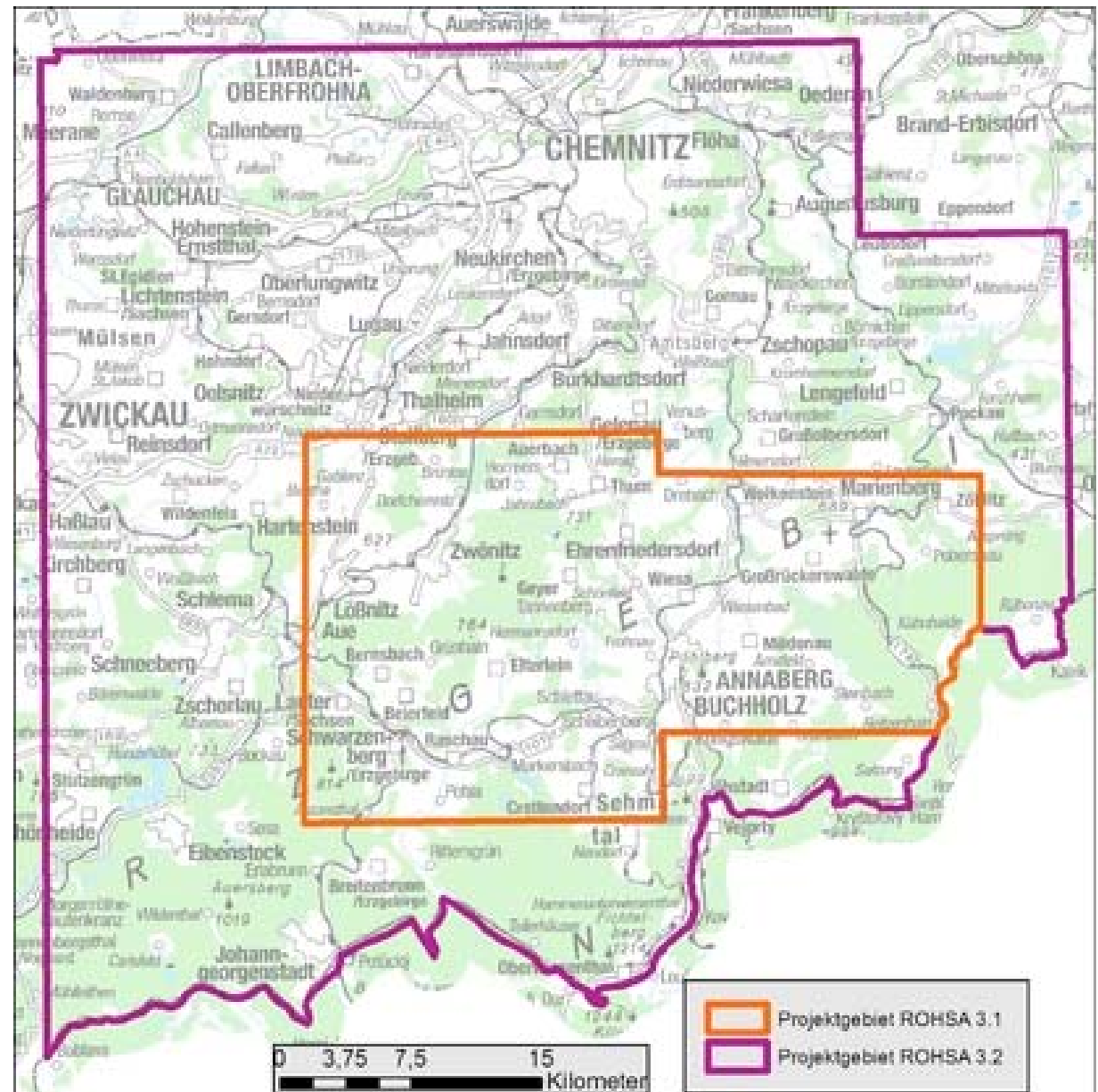
Filing and scan of >40000 files with more than 2.6 mio pages

Digitalization of 300 Wismut core drillings and assessment of 70.000 geophysical and approx.240.000 geochemical data sets



Enhancement of the research area → defining the resource base

located in the Erzgebirge in the district of Erzgebirgskreis. It covers an area of about 110 km² between the towns of Grünhain-Beierfeld and Elterlein to the south, Zwönitz to the West, Gelenau to the north and Ehrenfriedersdorf and Geyer to the east. In the Geyer-Ehrenfriedersdorf area significant concentrations tin, zinc, tungsten, molybdenum, copper, iron, lead, silver and indium are to be found.



ROHSA 3.2 → Smart Specialisation in exploration

Geophysical Exploration in the Erzgebirge

Project partners:

Helmholtz Institute Freiberg for Resource Technology
(Coordinator)
TU Bergakademie Freiberg
German Federal Institute for Geosciences and Natural
Resources
Saxon State Agency for Environment, Agriculture and
Geology (expert support)

Research area: Geyer-Ehrenfriedersdorf im mid Erzgebirge
region, Saxony

Evaluation and development of modern techniques for the
delineation of mineral resources to depths reaching 500 meters
and to develop mathematical methods to create a realistic 3-D
model of the geological subsoil from the geophysical data
collected.

Aero-Electromagnetic Measurements

With airborne probes induced electric fields in the subsoil of the
earth, providing information about electrical conductivity, which
can be used to assist the mapping of mineralization in the rock.

Reflexion-Seismic Measurements
to highlight subsoil structures.

Transient-Electromagnetic Measurement (TEM), detects
subsoil electrical conductivity down to depths of several
hundred meters



EU – Saxon Efforts: Setting the Scene



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 4.11.2008
COM(2008) 699 final

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT AND THE COUNCIL**

The raw materials initiative — meeting our critical needs for growth and jobs in Europe

{SEC(2008) 2741}

2008

The sustainable supply of raw materials based in the EU requires that the knowledge base of mineral deposits within the EU will be improved. In addition, the long term access to these deposits should be taken into account in land use planning.



Ziel 3 | Cíl 3

Ahoj sousede. Hallo Nachbar.

2007-2013. www.ziel3-cil3.eu



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2010 ROHSAB Cross-border raw materials cadastre Saxony – Czech Republic

Re-evaluation of eight cross-border
mineral occurrences

Raw material awareness building (civil
society)

Partner:

- GKZ (lead partner)
- Regional development agency,
Usti nad Labem
- Czech Geological Survey





Perspektivy využití lokalit po těžbě surovin Přeshraniční zhodnocení a příklady best-practise

Bergbaufolgelandschaften und ihre Nachnutzung Grenzübergreifenden Bewertung von best-practise Beispielen



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Ziel 3 | Cíl 3

Ahoj sousede, Hallo Nachbar,
2007-2013, www.ziel3-cil3.eu

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ARBEIT UND VERKEHR



2015 Abandoned mining sites and their re-use – cross-border best practises from Saxony and Czech Republic

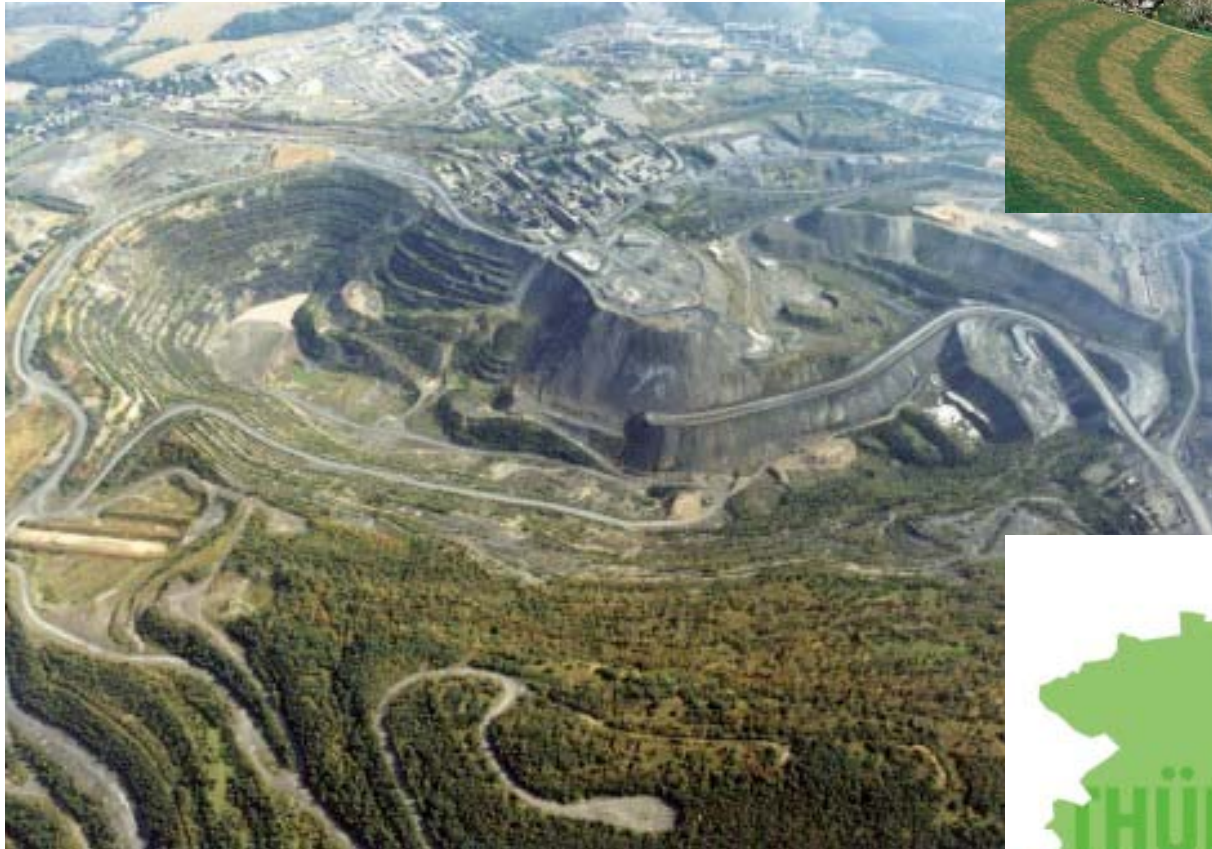
- Revitalisation
- Remediation
- Rehabilitation

- Linking stakeholders
- Defining further action



Saxon – Federal Efforts: R&D

Smart Specialisation in Remediation



Bundesministerium
für Wirtschaft
und Energie

Source: Wismut GmbH

Smart Specialisation in Remediation

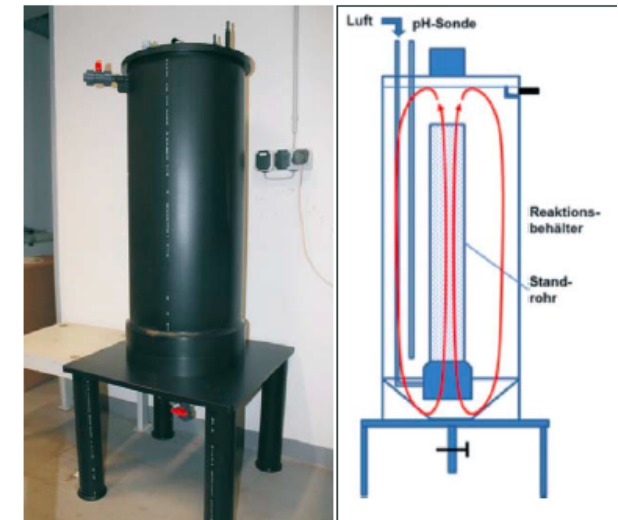
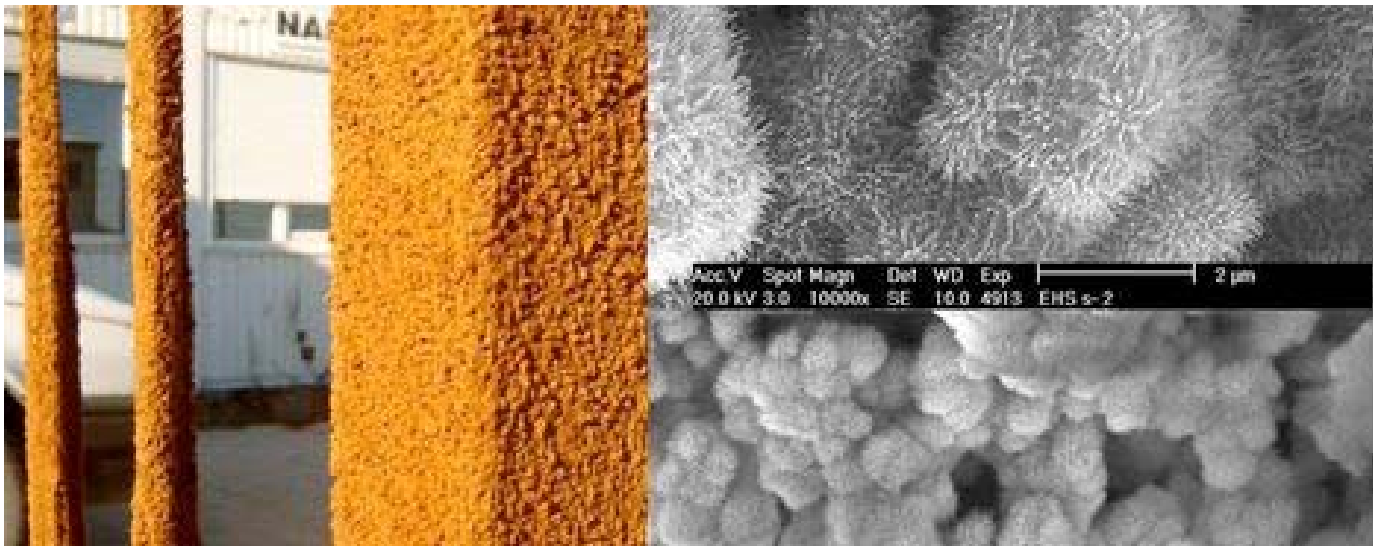
- Mine water treatment (sulphate reduction, extraction, heavy metals)
- Biological treatment technologies
- Remediation of radioactivity
- Radiation protection
- Environmental monitoring
- Flooding of mine works
- Geotextiles, dump site geotechniques
- Site development
- Extraction of valuable metals
- Re-evaluation of Wismut mining sites



Saxon – Federal Efforts: R&D

Smart Specialisation in Remediation

- Acid mining drainage
- groundwater management and protection
- in-situ-remediation of contaminated soil and aquifers
- Re-gain of valuable by-products from combustion ashes



Federal Efforts: R&D

GEFÖRDERT VOM

 Bundesministerium
für Bildung
und Forschung

 **FONA**
Ressourceneffizienz
BMBF

Herausgeber: Anke Dürkoop, Christian Peter Brandstetter, Gudrun Gräbe, Lars Rentsch

Innovative Technologien für Ressourceneffizienz –
Strategische Metalle und Mineralien

Ergebnisse der Fördermaßnahme r³



Innovative Technologies for Resource Efficiency – Strategic Metals and Minerals (2012-2016)

Smart Specialisation in Recycling

Remining – Mining after Mining

Technology testing and setting up a Mine dump cadastre for valorisation of abandoned mine sites



Economically Strategic Resources (r4) 2015-2019

- Development of concepts for the exploration of primary raw materials
- Development of environmental friendly concepts for the valorisation of complex ores of known ore deposits
- Recovery of processing and production rejects
- Promotion of junior research

www.r4-innovation.de



"ResErVar" Resource Potential of Hydrothermal Deposits of the Variscan

→ knowledge on deposit geology

"AFK" New Strategies for die processing of complex ores

→ valorisation of domestic resources in the Erzgebirge

Federal Efforts: Clustering, (trans-european) Networking, Regional smart specialisation



Clustering and Regional smart specialisation:

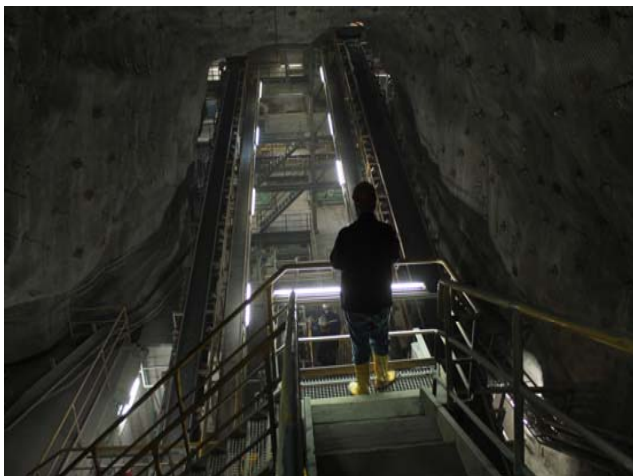
LiFG: Development of a regional technology platform for the exploitation, processing and recycling of Lithium

Geobiotechnology in Mining and Remediation

→ GAIN

GAIN: Geobiotechnological Applications for processing Industrial Nonsulfidic raw materials

→ FAME



EU Efforts: R&D



FAME Flexible And Mobile Economic processing technologies → valorisation of domestic resources in EU (incl. Cross-border Li/Sn-deposit Zinnwald/Cinovec)

AFK New Strategies for die processing of complex ores → valorisation of domestic resources in the Erzgebirge (spec. Greisen and skarn occurrences)

BIOMORE Research on future mining techniques, including reduction of environmental impact (targeting cross-border copper shale occurrences between SN-PL)

BioFlex	Flexible Biometallurgy Infrastructure and Expertise network
inSPECTor	Integrated spectroscopy sensor system for laser-induced fluorescence and hyperspectral imaging
PreFlex	pre-treatment and physical separation of complex low grade ores and residues
RoStar	Upscaling of the RoStar ultra fine grinding mill for liberation of high valued ores

Roadmap of smart specialisation in mining and metallurgy in Saxony

A summary

1. Historical background and strong commitment to mining, metallurgy
2. 1990: Termination of mining, start of remediation works #
new market conditions – strong competition → need for action:
 - a) Intensify R&D, portfolio development
 - b) Generation of niche markets
 - c) Overcome fragmentation, networking, lobbying, knowledge → GKZ
3. Since 1990: Financial support by public incentives (7 billion € in Wismut clean up), revitalisation of abandoned lignite mining sites, R&D on acid mining drainage → also as part of the economic aid programme for East Germany
4. Since 2008: RM supply crisis; paradigm change: Improvement of framework conditions, industrial clusters, valorisation of domestic mineral resources,
5. Since 2012: → enhancing collaborative research, industry driven research foundation of federal research infrastructure in Saxony (HZDR), portfolio change, „consulters become miners“
6. Since 2014 „Going EU“ (Horizon 2020; Interreg, EIT...), Internationalization, business extension, attracting investors by valorisation of historic data

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Glück Auf!

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Smart specialisation: putting mine facilities underground



Smart specialisation: Develop new extraction ways

