The Future of FGD Gypsum in Europe 25th

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5. Summary
The Gypsum Industry in Europe Eurogypsum AISBL

- Founded in 1961 in Geneva
- Registered in Belgium since 2006
- Full Members:
  - National Gypsum Associations
    11 covering Western Europe, Poland and Turkey
- Associate Members:
  - Companies in countries without associations
    Five companies
With a turnover of over 7.7 billion EURO, the European gypsum industry operates

- 154 quarries
- 164 factories (plaster powder plants, plaster block plants and plasterboard plants) and

- generates employment directly to 28,000, indirectly to 300,000 people and indirectly for 1,000,000 plasterboard installers.

- It is one of the few fully integrated industries within the construction products field.

**The European Gypsum Industry covers the whole life-cycle of the product (from extraction to recycling).**
Common objective of the European energy policy is to reduce GHG\(^1\) emissions EU-wide. The EU Climate & Energy Package\(^3\) defines 3 explicit targets “20 – 20 – 20” based on 1990 level and changed in 2014\(^4\):

- 20% (40%) reduction of GHG emissions by 2020 (2030)
  
  Current status (2012): 19,2%

- 20% (35%) share of RES\(^2\) in electricity generation by 2020 (2030)

- 20% (min. 27%) increasing in energy savings by 2020 (2030)

For 2050 the European Commission proposes a “competitive low-carbon economy” with GHG emission reduction of 80-95%.

The most part of CO\(_2\)-equivalents emission results from energy generation (79% in 2012).

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1) GHG: Green House Gas

2) RES: Renewable energy sources


Energy Policy in Europe – Similarities and differences

But the current situation differs from member state to member state significantly:

- **RES share** (2012) of electricity generation in EU-MS\(^1\) from 6,1% (Hungary) to Austria (65,5%), EU average 23,5%.

- Coal/lignite share (2012) of electricity generation in EU-MS from 1% (Sweden) to 92,5% (Poland), EU average 27%.

The current situation and the way how to achieve the EU goals is very different from country to country. As only in Germany a clear roadmap for energy policy until 2050 exists it has to be distinguished between Germany and the EU in the following.

But at first let´s have a look on the current FGD gypsum production in the EU and Germany as the main producer.

\(^1\) MS: Member State without small countries
Current status of FDG gypsum production in the EU

FGD gypsum quantities 2005-2012
(EU15\(^1\)) and Germany\(^2\))

mill. tons/year

2005 2006 2007 2008 2009 2010 2011 2012

11.5 11.2 10.8 11.3 10.6 10.2 11.3

11.3

(EU 28: 18 mill. t\(^1\))

1) ECOBA (15 Member states) EU: 28 Member states
2) VGB Powertech
The German Energy Policy Concept

Why separate assessment of Germany? Biggest FGD gypsum producer in the EU

Energy Concept Germany (28.09.2010)
(Gross power generation and RES2) shares before exit-decision of nuclear power generation

2) RES: Renewable Energy Sources
Gross power generation in Germany - after exit-decision of nuclear power generation (2011)
(Basis: Energy Concept of German Government, 28.09.2010, changed by lead scenario 2012)

1) Federal Ministry for Economic Affairs and Energy 2012
Source: Long term scenarios and strategies for development of renewable energies in Germany taking into consideration the development in Europe and worldwide (scenario BMU-FKZ 03MAP146, 29.03.2012 (BMU Lead Scenario 2012)

The German Energy Policy Concept
## The German Energy Policy Concept

### Estimated impact on FGD gypsum production

Goals for GHG\(^1\)- reduction and RES\(^2\) share of gross electricity generation

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
<th>Current status</th>
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</thead>
<tbody>
<tr>
<td>GHG reduction (^3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2014</td>
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<tr>
<td>RES share (^3)</td>
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<td></td>
<td></td>
<td></td>
<td>26.20%</td>
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<td>RES share (^4)</td>
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<td></td>
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<tr>
<td>RES share (^5)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>coal / lignite share (^4)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>43.40%</td>
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<tr>
<td>coal / lignite share (^5)</td>
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1) GHG = Greenhouse Gas
2) RES = Renewable Energy Sources
5) BMU Lead Study 2012
Prospective development of FGD gypsum production in Germany

Fuel-shares of electricity production

**Coal/lignite %**

**Renewable energies (%)**

- **BMU Lead Study 2012** (worst case)
- **BMWI Energy Reference prognosis/Trend scenario 2014** (best case)
Prospective development of FGD gypsum production in Germany
The European Energy Policy

In the European Union there are some official publications and a lot of unofficial studies on the European energy policy, e.g.


- Energy Road Map 2050, COM (2011) 885 — 6 different scenarios, European Commission.


Against this background it is not easy which scenario should be taken as a basis for estimation of the prospective FGD gypsum production.
The European Energy Policy

Prospective development of FGD gypsum production in the EU

Goals for GHG\(^1\)- reduction and RES\(^2\) share of gross electricity generation

<table>
<thead>
<tr>
<th>EU</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
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</thead>
<tbody>
<tr>
<td>GHG reduction (^3)</td>
<td>20%</td>
<td>40%</td>
<td>80-95%</td>
<td></td>
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<tr>
<td>RES share (^3)</td>
<td>20%</td>
<td>35%</td>
<td>40,3-83,1%</td>
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</tr>
<tr>
<td>RES share (^4)</td>
<td>36%</td>
<td>45%</td>
<td>53%</td>
<td></td>
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<tr>
<td>coal and lignite share (^3)</td>
<td>2,1-15,2 %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>coal and lignite share (^4)</td>
<td>20%</td>
<td>12%</td>
<td>7%</td>
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</table>

Current status

<table>
<thead>
<tr>
<th>2012</th>
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<tr>
<td>22,4% (^5)</td>
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<tr>
<td>27,4% (^5)</td>
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</tbody>
</table>

\(^1\) GHG = Greenhouse Gas

\(^2\) RES = Renewable Energy Sources

\(^3\) EU Commission “Energy Road Map 2050”, COM (2011) 885

\(^4\) EU Commission “EU Energy Trends to 2050 - EU Reference Scenario 2013” (2013)

\(^5\) Eurostat
Prospective development of FGD gypsum production in the EU

EU

The European Union follows a strict “decarbonisation objective” in electricity generation in the time period 2010-2050:

- Nuclear share will be stable at 20% (2012: 27%).
- Coal/lignite share will decrease from 27% down to 7%.
- RES share will increase from 22% up to 53%.

Starting from these background data the FGD gypsum production will decrease from estimated 18 million tons/year down to almost 5 million tons/year.

But the databasis is not reliable enough.

Can the EU achieve these ambitious aims in terms of significantly increasing RES share regarding the substantially different situation in the EU-MS?

Germany

The data basis in Germany is based on a couple of studies with a large variety.

- Nuclear share will be zero in 2022.
- Coal/lignite share will decrease from 43% down to 2-15%.
- RES share will increase from 26% up to 65-85%.

Starting from these background data the FGD gypsum production will decrease from 7 million tons/year down to 0.3-2.2 million tons/year.
Beside a reduction in quantity another issue is important for the use of FGD gypsum: the quality.

Due to LCP-BREF process the emissions of mercury and other heavy metals (?) have to be reduced tremendously.

- The enrichment of these pollutants in the FGD gypsum has to be avoided by all means.
- Otherwise the European gypsum industry cannot guarantee the further use of this secondary raw material.

What are the counteractive measures for the European gypsum industry for raw materials supply protection?

- Increasing activities for recycling gypsum waste, first of all plasterboard waste (estimated medium-term 2 mill. tons/year).
- As the recycled gypsum cannot compensate decreasing FGD gypsum quantities: Increased use of natural gypsum will be necessary.
Thank you for your attention!