

NORM-Projects

Radiological study of transport and processing of naturally occurring radioactive materials.

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NORM-Projects

- Environmental and Energy related research
- Development and application of nuclear measurement aperture



Outline

NORM-Projects

- NORM projects
 - NuTeC-NORM
 - B-NORM
 - EUR-NORM
- Outlook / new research topic:
 - treatment of (NORM) contaminated waste



NORM industries (New European Directives BSS)

NORM-Projects

- List of NORM industries which will require regulatory consideration:
 - Extraction of rare earth from monazite
 - Production of thorium compounds and thorium containing products
 - Processing of niobium/tantalum ore
 - Oil and gas production
 - Geothermal energy production
 - TiO₂ pigment production
 - Thermal phosphorus production
 - Zircon and zirconia industry
 - Production of phosphate fertilisers
 - Cement production, maintenance of clinker ovens
 - Coal-fired power plants, maintenance of boilers
 - Phosphoric acid production
 - Primary iron production
 - Tin/Lead/Copper smelting
 - Ground water filtration facilities
 - Mining of ores other than Uranium ore
- Including relevant secondary processes
- Member States should add other relevant activities



NuTeC –NORM project (15/12/08 – 14/12/10)

NORM-Projects

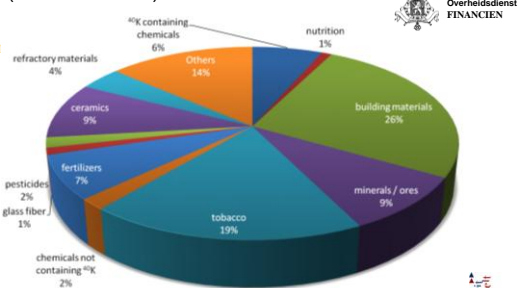
- Construction of a NORM-database (Harbor of Antwerp)



NORM Database [23/04/07 – 31/08/10]:

NORM-Projects

Alarms at detection portals at customs of Antwerp: (103600 'events'):



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EUR-NORM: 4th EAN-NORM workshop

ROUND TABLE WORKSHOP



**“Transportation of NORM,
NORM Measurements and Strategies,
Building Materials”**

Second Announcement
Nov. 29th - Dec. 1st 2011,
Hasselt (Belgium)

- Duo presentations
- Exhibition
- <http://www.ean-norm.net/>



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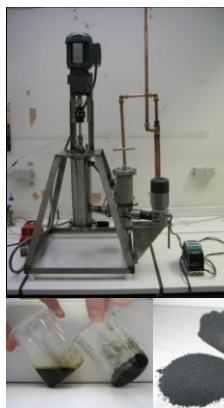


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Pyrolysis

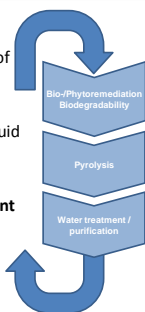
- **Input: Biomass / waste:**
 - Metal contaminated willow
 - Domestic waste
 - Sludge from water treatment
 - ...
 - **NORM contaminated biomass or waste?**
- **Output → validation?**
 - Pyrolysis liquid
 - Pyrolysis gas
 - Char
 - Valorisation activated carbon: **Adsorbens for metals, radionuclides?**



New research topics: Treatment contaminated soils and waste water

NORM-Projects

- **Bio- and/or phytoremediation** for the treatment of the radiological contaminated soils.
- Conversion of (Contaminated) biomass to char, liquid and gasses by means of **pyrolysis**.
- Study of (activated) char carbon is for the **treatment of the waste water** at contaminated sites.



Collaboration:
XIOS – UHasselt – KULeuven – KHLim - SCK-CEN



Acknowledgement

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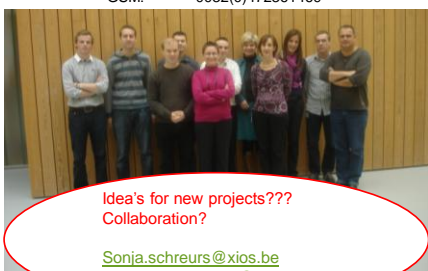
- NORM projects Sponsored by:
 - Flemish Community (**Hermesfonds**, 45%),
 - European Funds for Regional Development (**EFRO-support**, 40%)
 - XIOS University College Limburg (15%).
- New research 'treatment contaminated soils and waste water sponsored by:
 - LRM



NuTeC – www.nutec.be

NORM-Projects

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Idea's for new projects???
Collaboration?

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