Sewage sludge utilisation

Prospects in the Rhenish mining area

Almost two million tonnes of sewage sludge are produced in NRW every year. Almost every second delivery is thermally utilised by RWE. But in the future, phosphorus, an element essential for life on earth, will also be extracted from sewage sludge.

Continuous expansion of infrastructure: Ground-breaking ceremony for the expansion of the sewage sludge hall at Knapsacker Hügel (2019)

RWE has been a partner in the utilisation of sewage sludge for over 25 years

- Use of sewage sludge as an additional fuel to coal
- Improving the CO_2 balance in the production of district heating and steam
- Orientation towards increasing demand for thermal utilisation
- Outlook: Preparation for phosphorus recycling from 2029

RWE actively researches all aspects of long-term sewage sludge use

- Further development of co-incineration
- Development support for a mono-incineration plant project
- Sewage sludge treatment (e.g. drying, grinding)
- Thermal conversion (e.g. incineration, pyrolysis, gasification)
- Phosphorus recycling

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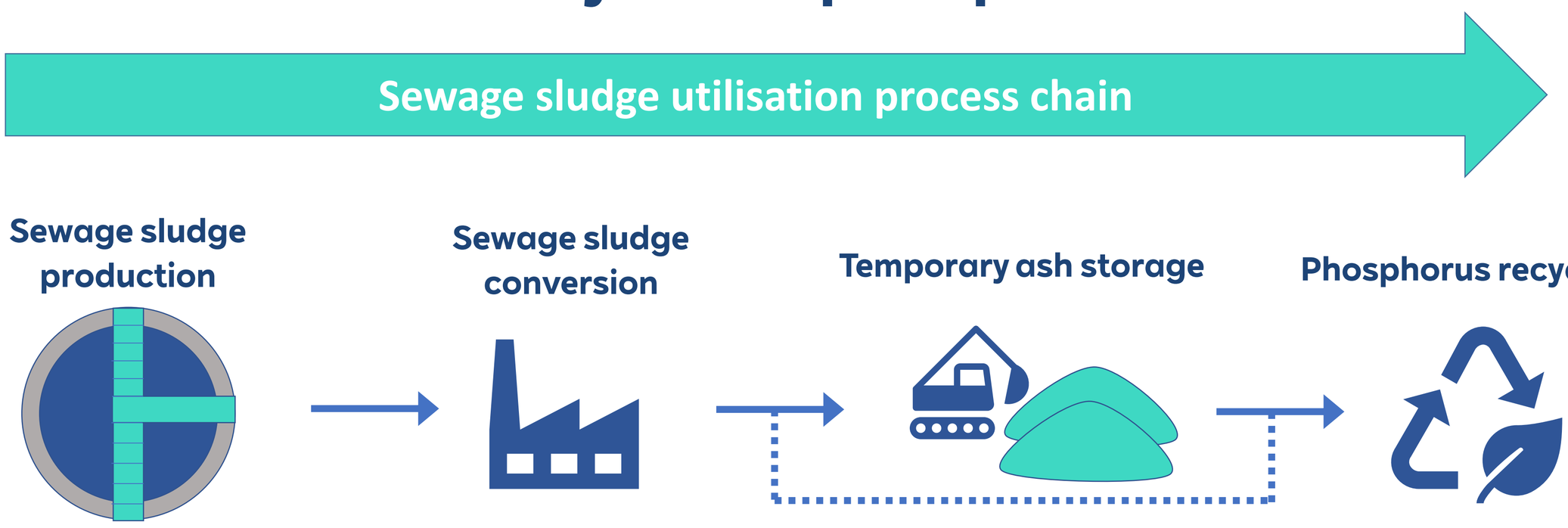
Sewage sludge utilisation

Activities in the specialist areas of power plant engineering and mineralogy

Sewage sludge is considered waste, but its energy content and also the valuable substances it contains, such as phosphorus, can be used. The departments of mineralogy and power plant engineering are researching the processes for this from the laboratory to the pilot plant.



- Classification into sewage sludge classes
- Seasonal and regional influences on composition
- Basic analysis for pilot plants

- Use of sewage sludge in small-scale incineration plant
- Project VeRa: Sewage sludge incineration and corrosion in the flue gas path
- Project Verena: Gasification of sewage sludge

- Chemistry of sewage sludge ash and slag
- Residual materials from sewage sludge conversion
- Landfilling and recovery of sewage sludge ash

- Phosphorus release behaviour
- Analysis of conversion products

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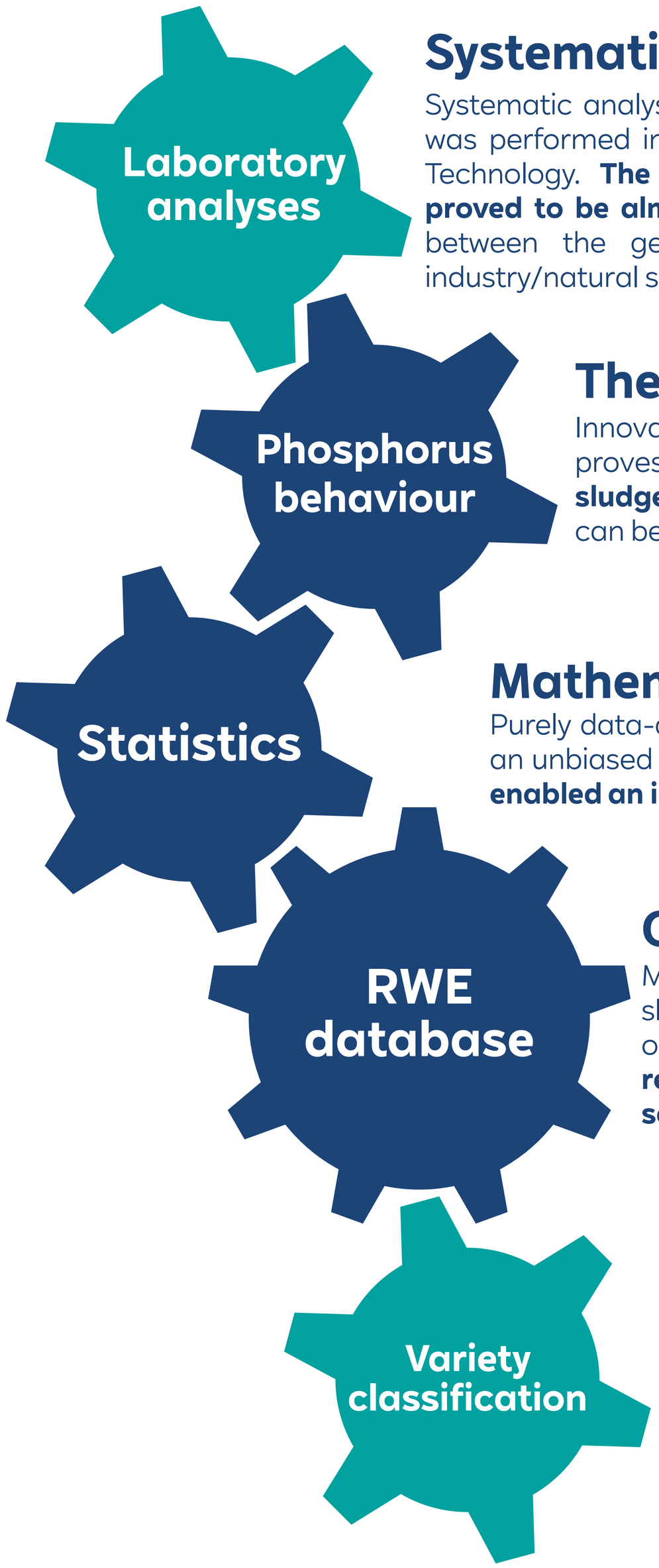
Sewage sludge utilisation

Results of future-oriented research by the Department of Mineralogy



Systematic sewage sludge analyses

Systematic analysis of 240 lots of sewage sludge from 60 RWE suppliers was performed in cooperation with the Freiberg University of Mining and Technology. **The chemical composition of the individual generators proved to be almost constant over the year**. In contrast, the deviations between the generators were large and partly dependent on the industry/natural soils on site.

Thermal element release

Innovative process by Freiberg University with funding from RWE proves **different forms of phosphorus binding in sewage sludge**. Phosphorus released at low temperatures in particular can be **useful for P recycling**.

Mathematical data analysis

Purely data-driven mathematical-statistical evaluation should provide an unbiased view of the data from the 240 lots of sewage sludge. **This enabled an initial classification of the sewage sludge** to be **derived**.

Group-wide analysis library

More than 15,000 datasets from 20 years of sewage sludge co-incineration at RWE narrow down the bandwidths of the main and trace elements. The **emission and landfill-relevant data help in the design of future plants and the search for new recycling pathways**.

Further R&D activities

RWE plants benefit from tests in the **laboratories and pilot plants at the Niederaussem site**. Sewage sludge supplies are to be classified in terms of deposit formation and corrosion. This can be used to derive **recommendations for boiler operation and for sewage sludge suppliers**.

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