



# VSGM presents MID MIX



A circular solution for sludge treatment  
with a strong business case





# About us

Our mission is to make the world cleaner with the introduction of our unique circular waste treatment technology. We are taking a step forward to make the sludge and waste industry more sustainable.

VSGM was founded with the goal of introducing the MID MIX® technology in Europe but are also open to scale outside our continent. We provide the technology and supply the full MID MIX® process but do not operate installations ourselves. VSGM has exclusive sales rights to the globally patented MID MIX® technology.

Various studies show that the MID MIX® process provides a positive business case and environmental benefits. In addition, all necessary certifications have been achieved for off-take of the end product Neutral. We aim to support our clients with long-term partnerships.





# The MID MIX technology



## Sludge

Almost any sludge or similar material with a DS content between 18-70% is a useful input material for the MID MIX process.

We have processed sludge from municipal waste water treatment, industrial (water treatment) sludges, biogas production digestate, soil remediation residue and more.



## MID MIX

In the MID MIX reactors, quicklime ( $\text{CaO}$ ) is added to react with the sludge. Most of the  $\text{CaO}$  (Calcium oxide) reacts with water to form calcium hydroxide ( $\text{Ca(OH)}_2$ ), while some of the organic matter in the sludge is converted to calcium carbonate ( $\text{CaCO}_3$ ).

In addition, released nitrogen is captured as ammonium sulphate. This creates a useful feedstock for the fertilizer industry.



## Neutral

The mixture of calcium hydroxide and calcium carbonate forms a high-quality end product called 'Neutral'.

Thanks to its high calcium content, Neutral can be used as a building material, for example as active filler for concrete or asphalt. It can also be used in other applications, such as replacing primary calcium hydroxide in flue gas cleaning.

# Economic benefits



CAPEX requirement and payback period are significantly lower than competitive technologies. Investment payback time is between 2-5 years.



Field-upgradable; plant throughput is easily increased.



After a short commissioning phase, any production line quickly becomes cash-low positive, making MID MIX an attractive and sustainable alternative.



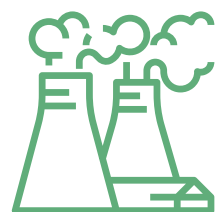
Main output is a certified end-product Neutral that can be sold at positive value.



# Environmental benefits



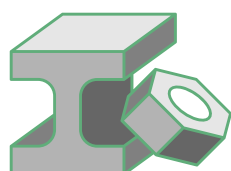
Negative CO<sub>2</sub> footprint: In the process, CO<sub>2</sub> is stored.  
Neutral also has potential as CCU material for further CO<sub>2</sub>-capture after post-processing.



Very low NO<sub>x</sub> or NH<sub>3</sub> emissions.



No waste is created, just valuable products.  
Neutral and ammonium sulphate are both useful secondary resources.

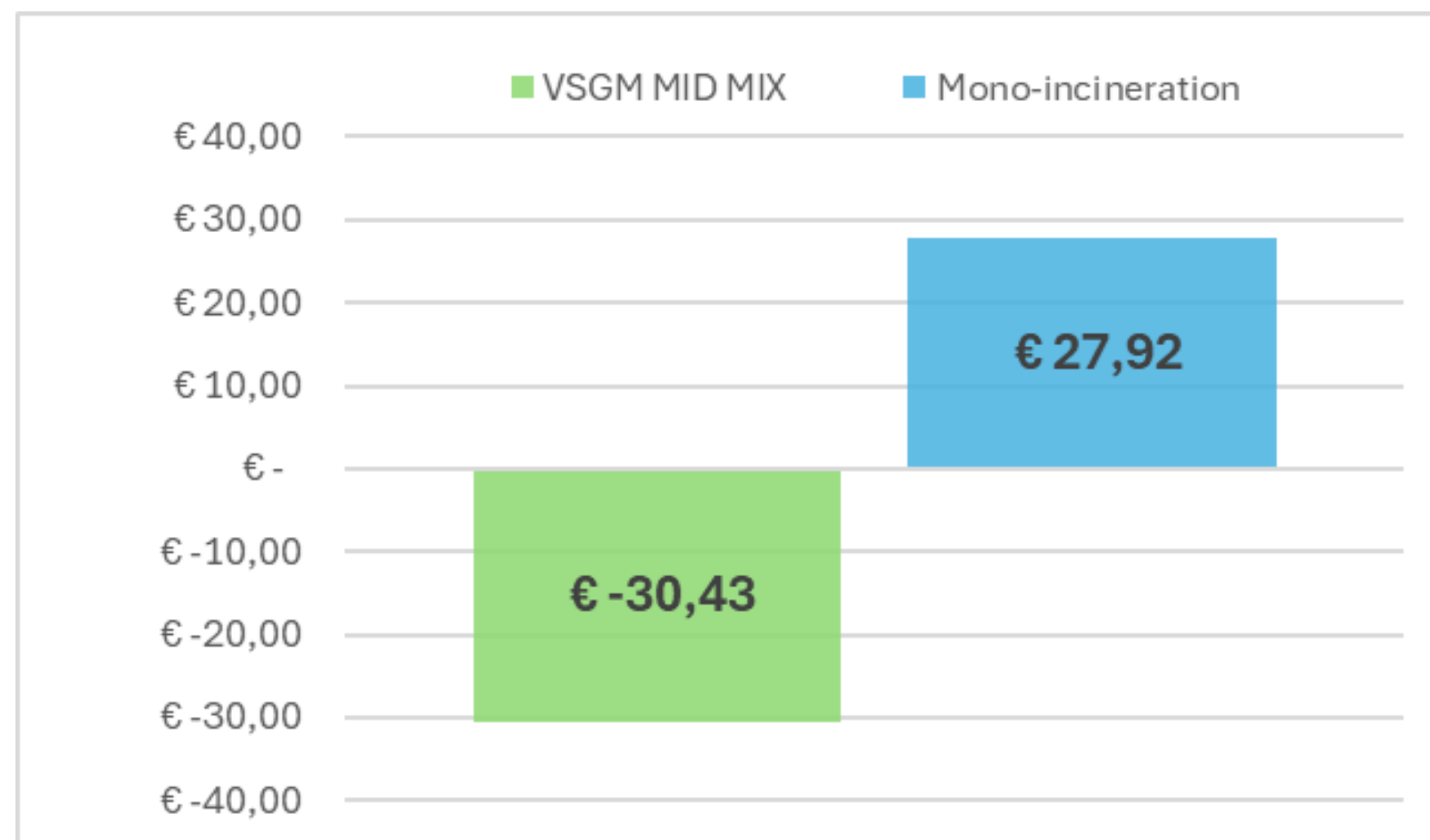


Heavy metals are permanently encapsulated in the process.

# Environmental impact cost indicator

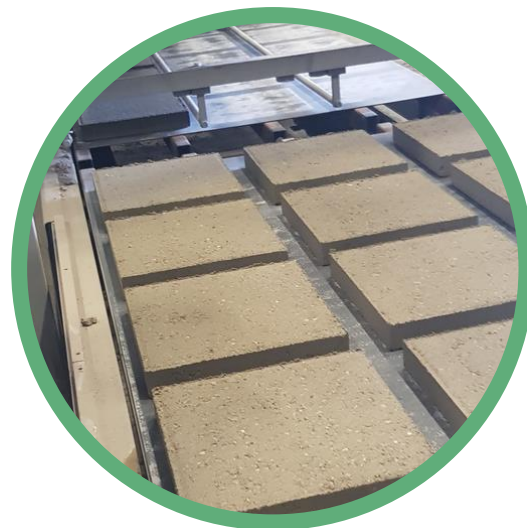
Comparison of environmental cost (aggregating all environmental impacts)  
between MID MIX and sludge mono-incineration.

MID MIX shows a negative cost, indicating significant environmental benefit.





# Future



## Flexible end product

The end product Neutral offers many opportunities and flexibility for the future. For example, the product can be used in different ways.

Field research has shown that Neutral can replace up to 50% of cement in certain applications. VSGM is also continuously developing further post-processing options to add value.



## Better environmental performance

By using MID MIX technology, environmental performance can be easily improved.

First, because of the process itself, CO<sub>2</sub> is stored and no nitrogen is released.

Second, because the final product can replace other building materials. This combination sets MID MIX apart from other sludge treatment technologies.



## VSGM continues to improve MID MIX sustainability

Indeed, the biggest environmental impact in the MID MIX process is the production of the raw material CaO.

VSGM is working with the supplier of this raw material on making their production process more sustainable and on post-processing for recovery of CaO from Neutral. These will further improve both the business case and the environmental benefit of MID MIX.

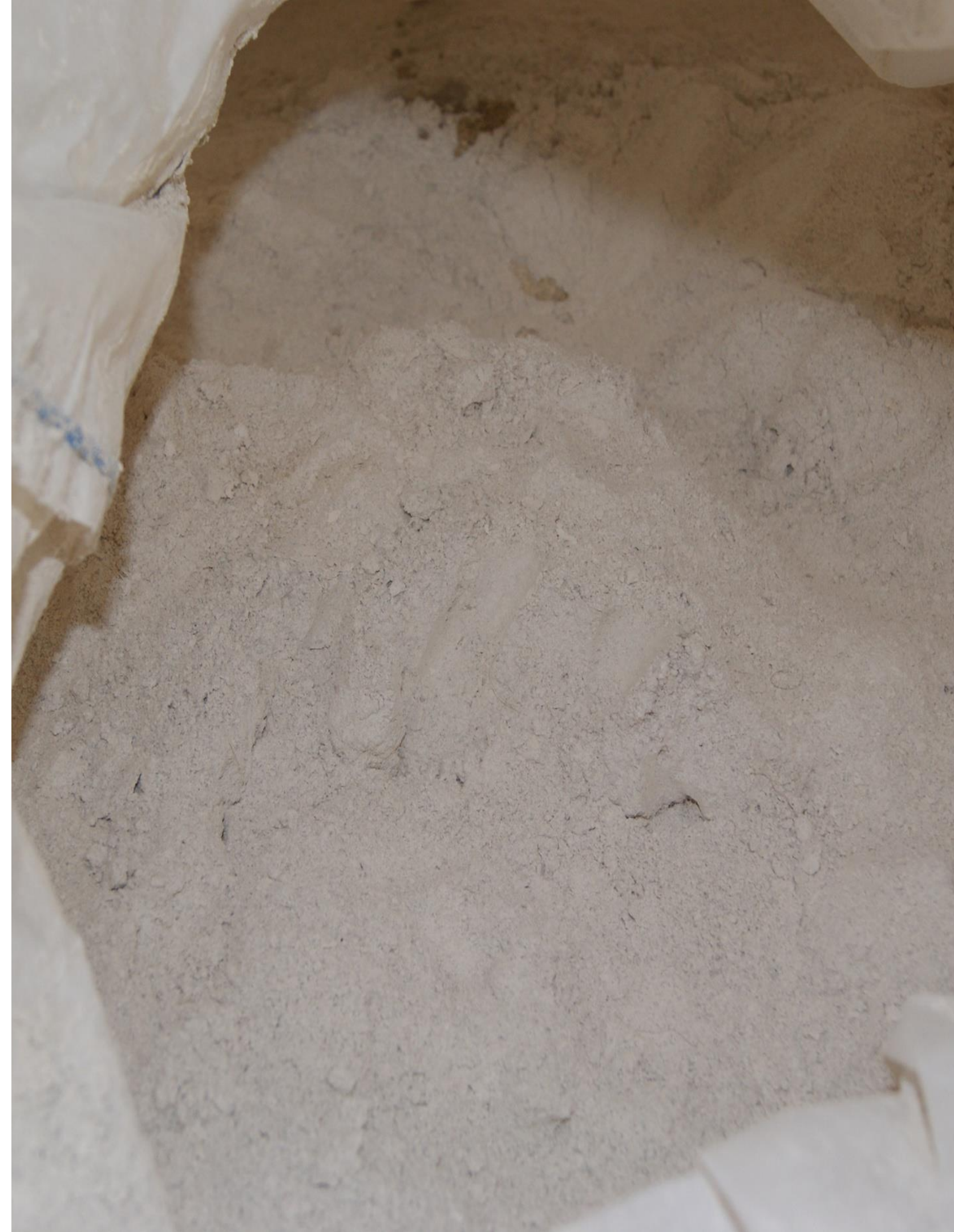


# Conclusion

VSGM's MID MIX technology provides a great business case for treatment of sludge and similar waste. At the same time, it performs significantly better environmentally than regular sludge incineration.

This makes it an opportunity to improve your company's or client's environmental performance. In addition, the processing costs per ton of sludge cake offer an interesting alternative to regular incineration or other sludge treatment technologies.

Finally, the possibilities for the future are great, with additional value-adding post-processing options in development. MID MIX thus offers your organisation the way to process sludge responsibly and save costs or increase revenue at the same time.







# Interested in our circular sludge treatment?

We are ready to help your business!



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