geocycle

For a zero-waste future

Improving the environmental impact of windmills decommitioning

Recycling the concrete

Transformation into granulates

Using the granulates back to concrete

Some technical limits due to the properties of the granulates:

Impurities

Porosity

➔ Limitation in a standard for concrete between 20 andc 30%, depending on the applications

➔ A part of the granulates are not recycled in concrete but used for other applications

Improving the technical qualities of the granulates

Carbonatation of the granulates

➔ Capture of the CO2 produced during the cement making process
➔ Porosity at the surface is reduced and the granulates gets similar properties as natural stones.
➔ Allows the increase of recycled granulates in the concrete

Recycling the carbonated granulates in concrete

Need to add cement, sand and water to the granulates

Potential Environmental improvements:

1) Water does not need to be drinkable ➔ recycled water is enough

2) Sand can partly be substituted by fine fraction of the crushing of concrete and other alternative materials

3) Low CO2 cement can be used

Recycling the CO2 in concrete applications

Carbonating the concrete at its production stage

Up to 300 kg of CO2 intake per ton of cement used is possible

Solidia Technologies

Reducing the impact of cement production

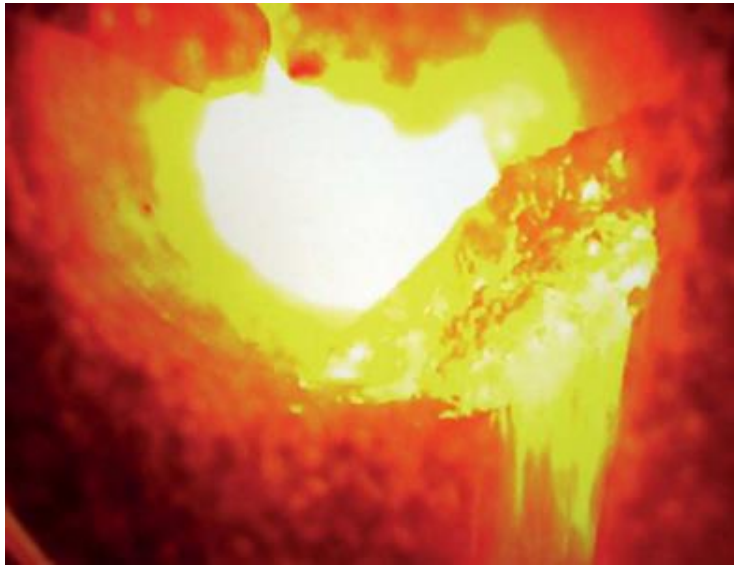
Portland cement is a mixture of clinker and gypsum.
The production of clinker is energy and resource intensive
A composite cement with a reduced clinker content will reduce the environmental impact and increase the recycling or residues

➔ Low CO2 (composite) cement can be used

Reducing the impact of clinker production

Waste can be coprocessed and produce the energy and the raw materials needed for the production of clinker.

1/3 of the CO2 emissions coming from fuels
2/3 of the CO2 emissions coming from decarbonatation of limestone



Reducing the impact of clinker production

The use of waste with a lower emission factor than coal or petcoke allows a reduction of the CO2 emissions

➔1 ton of windblades will reduce by 110 kg the CO2 emissions of the plant. At the same time: a saving of 461 kg of raw materials

No residues left over

➔ A major difference to classical incineration or landfilling

Reducing the impact of clinker production

Goal : >90% of the thermal energy will come from non recyclable waste streams

The use of partly decarbonated wastes allows a reduction of the raw materials and energy consumption together with a CO2 emissions reduction

➔ The fine fraction from the crushing of concrete can be used in the clinker kiln in order to reduce the CO2 emissions from the decarbonatation ➔ use of the fine fraction from concrete which is today partly landfilled

Improving the environmental impact of windmills decommitioning: conclusions

Concrete and windblades can be fully recycled and recovered in a combined recycling loop, where all residues are integrated in the recycling.

The recycling of concrete and windblades can help to reduce the CO2 emissions produced during the production process.
Climate impacts are a full topic in the recycling applications

CO2 prices will support the development of CCS in the recycling of concrete

Recycling can still be improved and global environmental impact reduced at all stage of the recycling loop.

Regulatory support is needed to avoid landfilling of usable material

Improving the environmental impact of windmills decommitioning

Thanks a lot for your attention