reCO2ver - FROM URBAN MINING TO CO2-SEQUESTRATION
CHALLENGE

Climate change ⇔ CO₂ emissions

Shortage and, at the same time, excessive consumption of resources

Downcycling instead of circular economy
CURRENT SITUATION

- For cement and concrete production large amounts of recourses are required
- This leads to a shortage of high-quality sands and aggregates
- The production of concrete leads worldwide to 8% of the CO2 emissions
- After demolition of concrete structures, the concrete demolition waste is mainly used for landfill
- Only a small part is crushed and used for recycled concrete
PROCESS

- Concrete Demolition Waste (CDW) gets pre-crushed and conveyed into the plant
- The CDW gets in contact with CO$_2$ and leads to carbonation of cement stone
- Due to mechanical impact the aggregates separate from the carbonated cement stone
- The outcome of the process are cleaned aggregates in separated fractions and the carbonated cement stone as powder
- Sika Admixtures improve the quality of the output materials
FUTURE SITUATION

- The reCO$_2$ver process enables concrete recycler and concrete producer to create a circular economy by re-using the concrete components in primary quality.

- The concrete demolition waste gets de-composed and by CO$_2$ sequestration the components are separated and can be re-used for high quality concrete.
PROCESS / LAB RESULTS

- The additional cement stone on the recycled aggregates leads to a larger water absorption.
- This required a higher cement content for concrete made with recycled aggregates.
- With the reCO\textsubscript{2}ver process the sand and aggregates are cleaned from cement stone.
- The cleaned aggregates show comparable water absorption as primary aggregates.
- No additional cement required for concrete with reCO\textsubscript{2}ver treated recycled aggregates.
VALUES OF reCO2ver

Circular economy of concrete

Saving natural resources

Use of concrete waste for CO₂ sequestration

Additional reduction of CO₂ emissions:
- By reduction of cement requirement in recycled concrete
- By partial replacement of clinker with generated fine powder
Sika invested in a reCO2ver pilot plant to demonstrate the process in large scale.
THANK YOU