



# Reducing the environmental footprint of building materials by enabling the circular economy

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# Concrete is needed to develop new and smart cities as well as to respond to a growing middle class and population growth at large



**Green Township in Gurgaon**

**Smart cities & reduced land use**

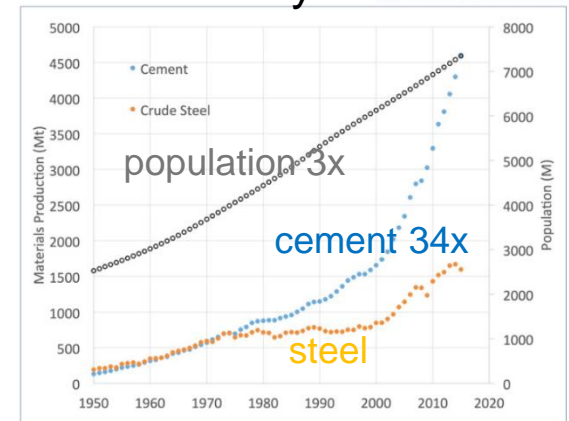
**Smart buildings & high performance materials**

**Infrastructures for mobility**

**(Grey) building blocks**



**Growth in cement use over last 70 years**



Source: UNEP Report (2016) "Eco-efficient cements"

**HEIDELBERGCEMENT**

# HeidelbergCement has committed to doing more with less

SUSTAINABILITY  
COMMITMENTS  
**2030**

SUSTAINABLE DEVELOPMENT **GOALS**  
17 GOALS TO TRANSFORM OUR WORLD



**DRIVING  
ECONOMIC STRENGTH  
AND INNOVATION**



**ACHIEVING EXCELLENCE  
IN OCCUPATIONAL HEALTH  
AND SAFETY**



**REDUCING  
OUR ENVIRONMENTAL  
FOOTPRINT**



**ENABLING THE  
CIRCULAR ECONOMY**



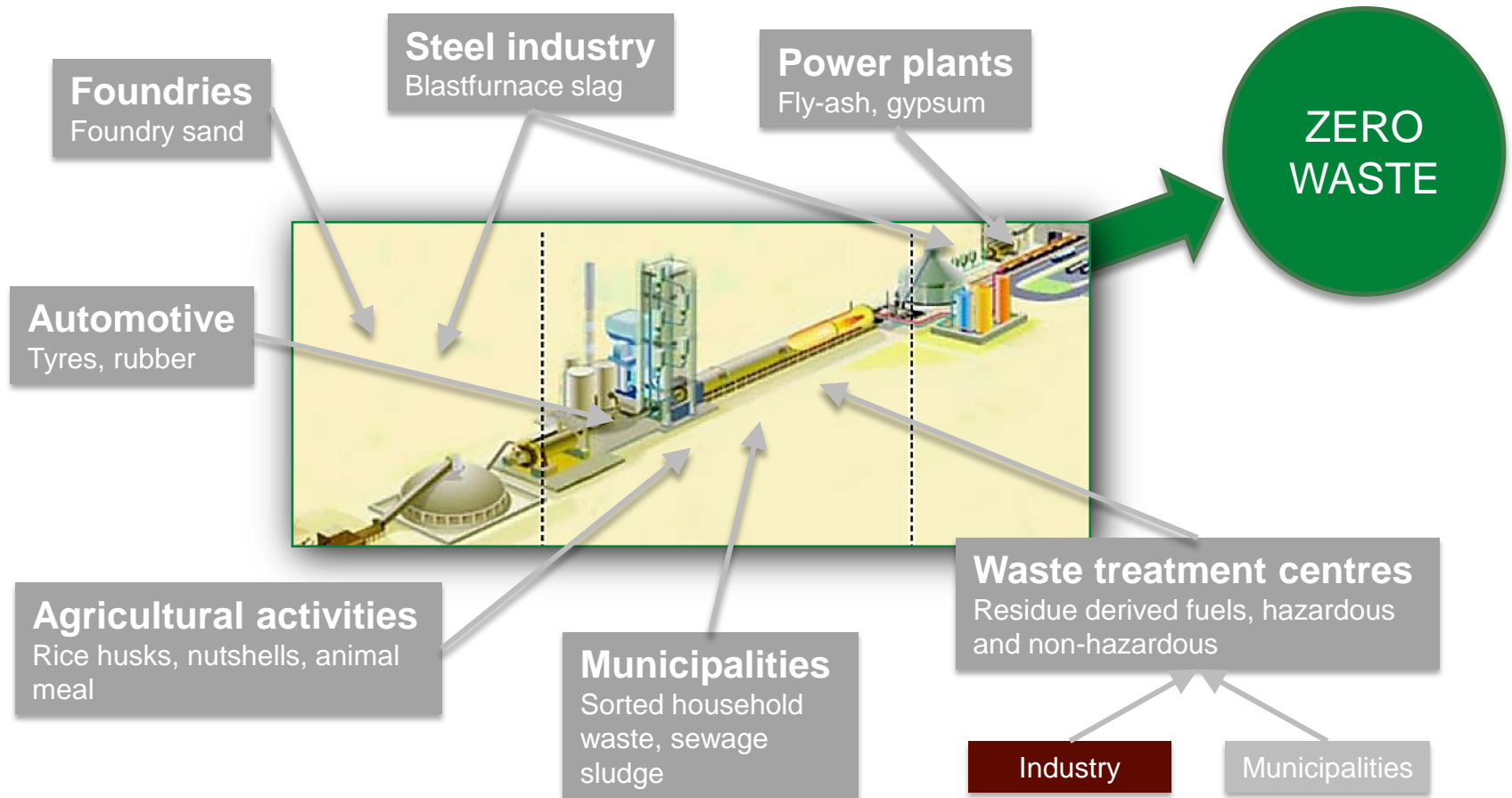
**BEING A GOOD  
NEIGHBOUR**



**ENSURING COMPLIANCE AND  
CREATING TRANSPARENCY**



# Cement production is at the heart of industrial ecology



HeidelbergCement recovers finite resources to minimise primary energy consumption

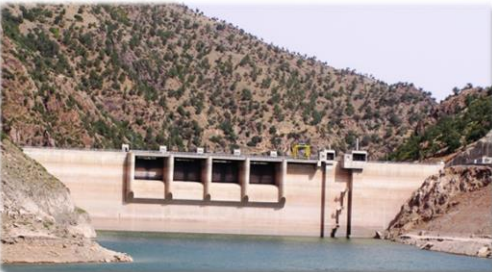
# Various levers in HeidelbergCement's strategy help lower the CO<sub>2</sub> footprint of its products by means of circular solutions

## Alternative raw materials

- Reduction of clinker content in cement and concrete
- Alternative cementitious systems
- Examples:



Fly-ashes cement used for a dam in Morocco



Use of slag cement for basements and massive construction parts for a power plant in Poland

## Alternative Fuels

### Biomass (zero emissions)

- sewage sludge
- Wood, paper, carton
- animal meal, animal fat
- animal bone meal



### Other fuels

- waste oil, tyres
- RDF



## Carbon Capture

- Pilots on capture technologies in Norway, Belgium, Italy
- Commercial use of CO<sub>2</sub> to generate biomass (fish meal) in Morocco on non-arable land



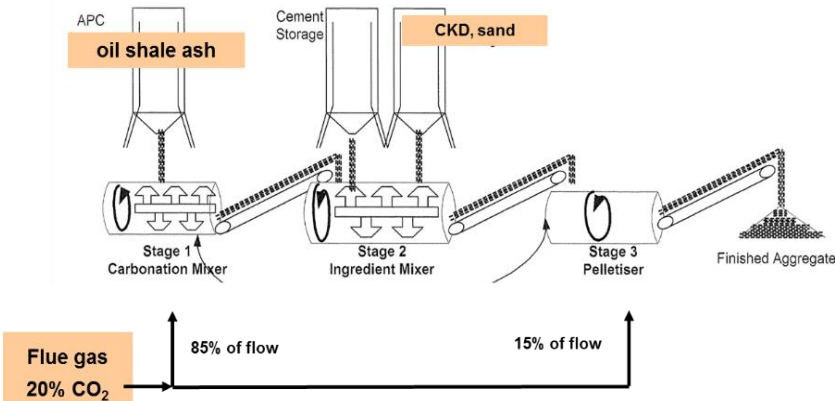
- Recarbonation of concrete: over its lifecycle, concrete structures naturally take up 10-25% of CO<sub>2</sub> emitted during calcination process
- Life-cycle thinking is key!

# Further innovation includes a circular carbon solution for producing aggregates and building materials with aesthetic value

## Light-weight aggregates from CO<sub>2</sub>

### CARBON8 project in Estonia

- **Carbonating CaO-rich ashes** with CO<sub>2</sub> produces light-weight aggregates
- 70k tonnes of aggregates **part of HC-Estonia sales**
- **EUR 3m investment** by HeidelbergCement
- Construction and permitting planned for 2018



## Aesthetic material reducing air pollution

### i.active BIODYNAMIC cement

- High performance, highly flowable cement mortar for non-structural architectural precast elements
- 80% recycled aggregate
- **Fully recyclable** after use as an inert material
- Use of **photocatalytic additives** (TX-Active) for **reduction of air pollution**.
- 80% White Carrara marble (scrap) + White cement (<20%) + Additives



Milan EXPO 2015: palazzo ITALIA



Thank you for your attention.

**CONTACT**

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