THE 2030 PLAN

BUILDING FOR TOMORROW

ESPCI, December 5th, 2016

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LafargeHolcim

Facts

Cement industry is responsible for 5% of global CO2 emissions

5%

573 kg/t

573kg/t net CO2 emissions per ton of cement in 2015

145 tons

145 tons of cement produced every second worldwide

13%

Part of cement in concrete

30-40%

Buildings are responsible for 30-40% of global CO2 emissions

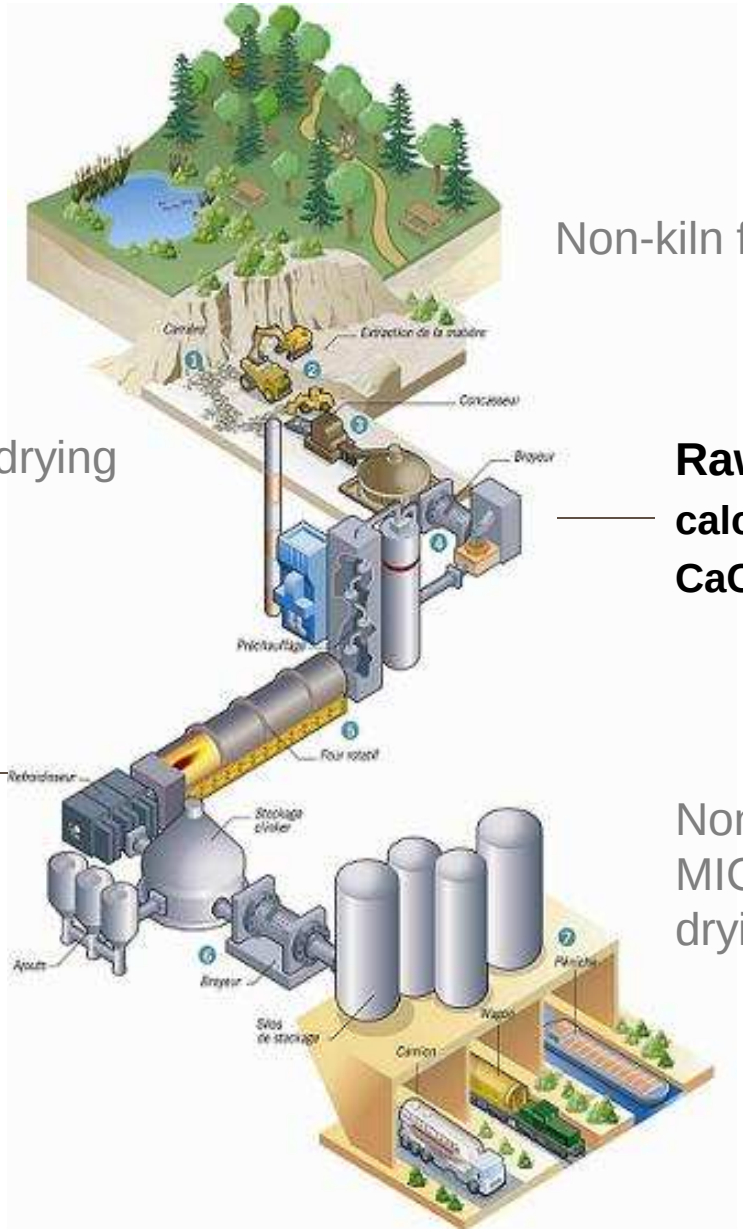
Sources of CO2 emissions: cement

Non-kiln fuels: quarry

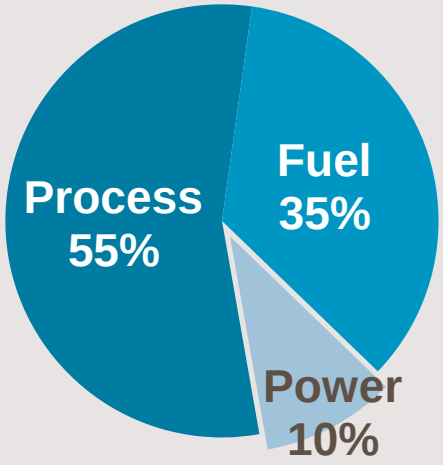
Kiln fuels:
raw materials drying

Raw materials:
calcination
$CaCO_3 \rightarrow CaO+CO_2$

Kiln fuels:
$C + O_2 \rightarrow CO_2$



Non-kiln fuels:
MIC and gypsum
drying

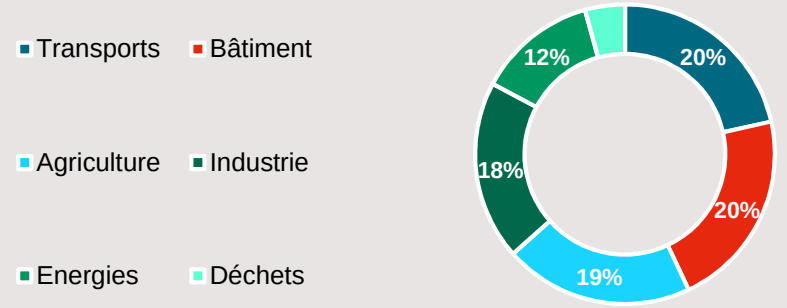


Main improvement levers

- **Production technology**
- **Product development**

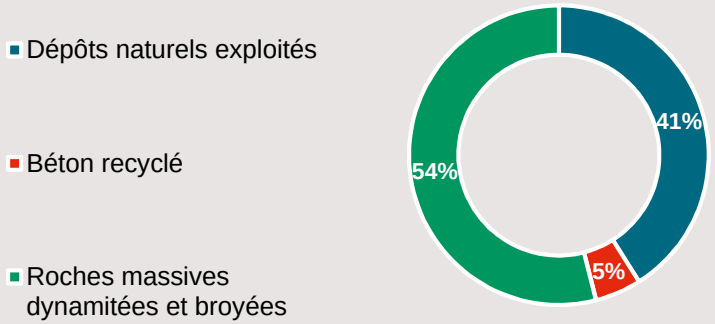
Sources of CO2 emissions: use of buildings

- Improving global energy efficiency of buildings is key to reduce CO_2 emissions in France
  - **Responsible for 20 % of GHG** (25% if we include power production needed for heating).



Contribution des différents secteurs d'activité aux émissions de CO2 en France
Source : Ministère de l'Ecologie, du Développement durable et de l'Energie, 2015

- Promoting recycled materials and life-cycle analysis to avoid new materials extractions (generating additional CO_2 emissions)
  - **Only 5% of recycled aggregates** used in France



Provenance des granulats en France en 2010
Source : Union nationale des producteurs de granulats (UNPG)

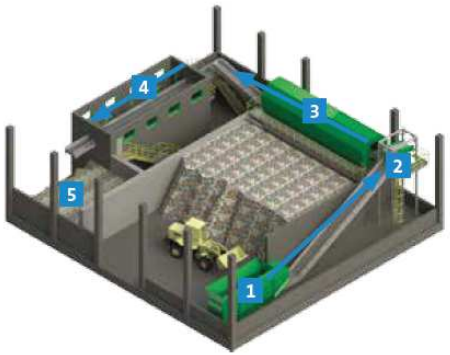
Solutions and services already existing

Usage of mineral components

Pushing the norms to increase the use of mineral components

geocycle

14 million tons CO_2 prevented in 2015



14 million tons of waste treated by Geocycle worldwide

Unique expertise

aggneo BUILDING THE CIRCULAR ECONOMY

LafargeHolcim will multiply by 4 the total amount of recycled aggregates

3 Billion Tons of C&DM generated globally every year, with >40 Billion Tons of aggregates consumed every year

Innovation and differentiation empowers us to escape from the “commodity” mindset….

Solidia Technologies

Up to 70% lower CO_2 emissions

Reduced energy consumption during production

Carbon uptake during concrete curing

Thinner structures

Reducing the amount of clinker in the final building / structure

DURABRIC

An affordable housing solution with significant environmental benefits

“14 Trees partnership” with the UK development finance institution to commercialize the solution

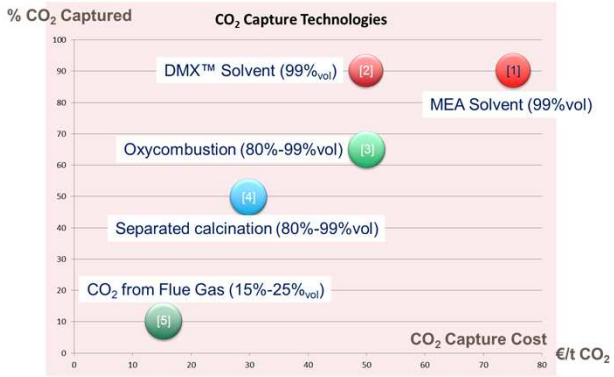
The transformation will require evolving standards & regulations as well as business models and partnerships

AIRIUM
Insulation Redefined

Insulating mineral foam

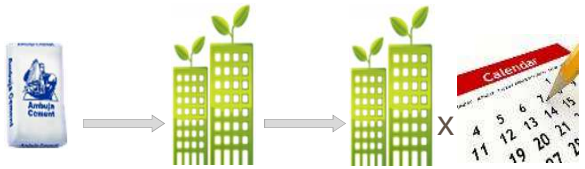
100% recyclable

Capture, Storage & Sequestration



Still to lower the capture CO2 cost
Logistics is critical in most CO_2 applications

New ways of measuring



$$\frac{CO_2}{t_{cement}} \qquad \frac{CO_2}{m^2_{use\ space}} \qquad \frac{CO_2}{m^2_{use\ space} \times service\ life}$$

Promoting new ways of measuring carbon emissions
Promoting «market-pull» measures (e.g. public procurement)