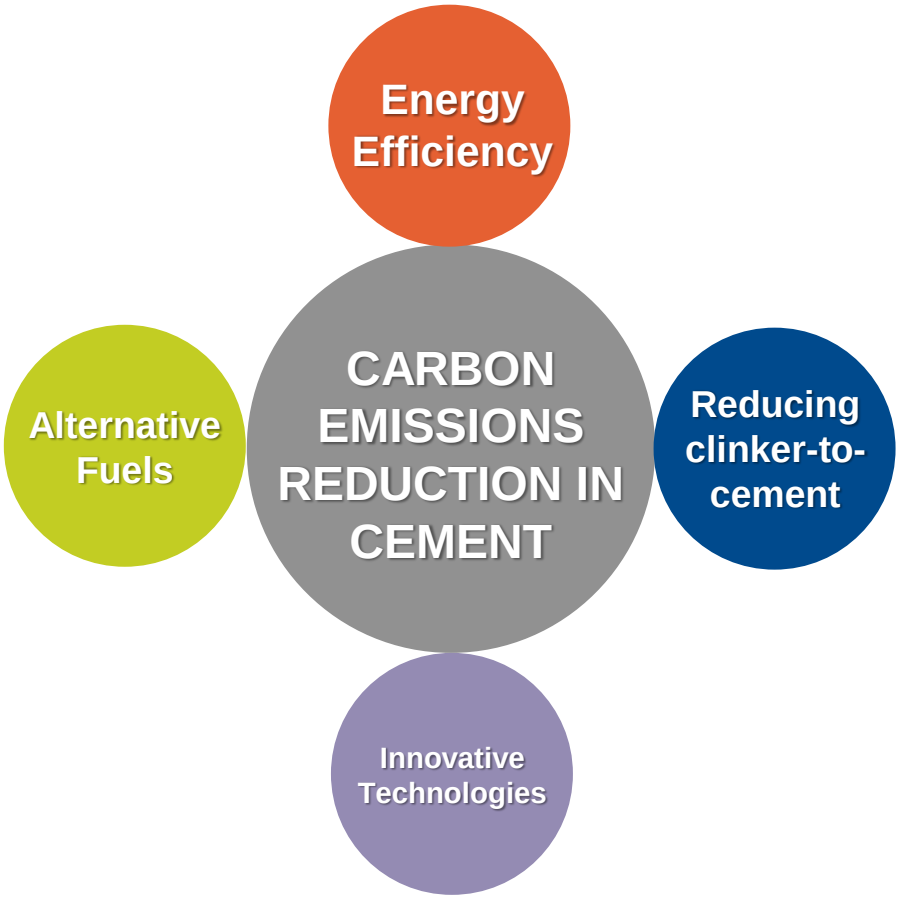
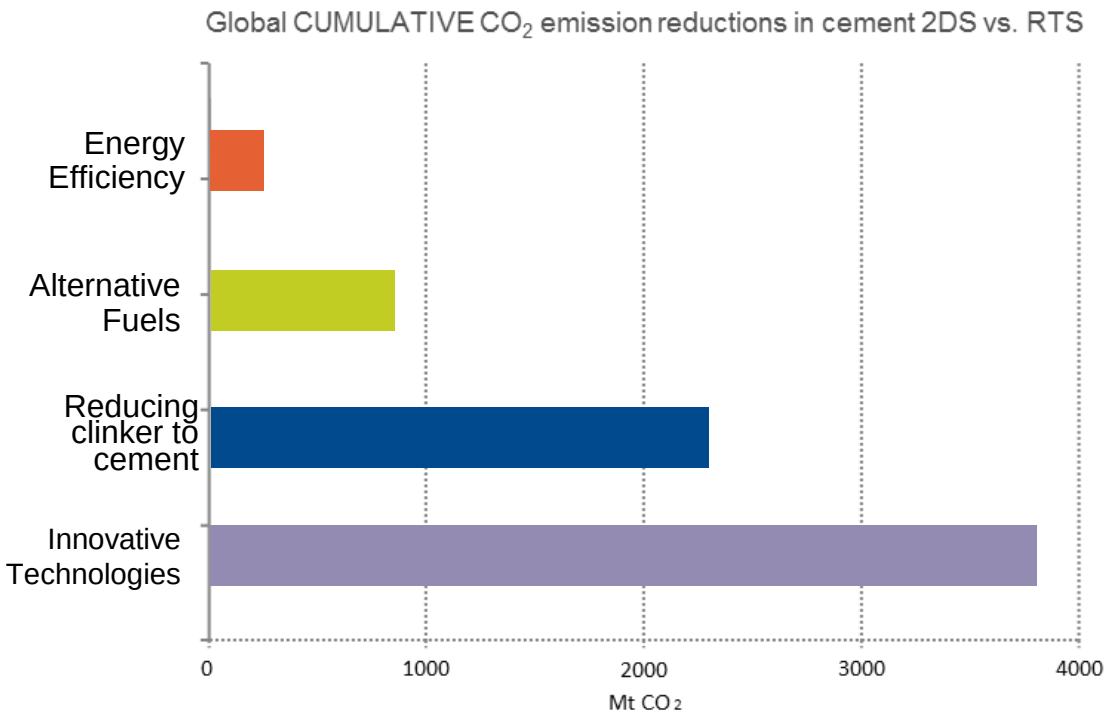
Innovation in CO_2 Mitigation by TITAN Cement Group

CemBureau Innovation Workshop

June 24th 2019 - Brussels

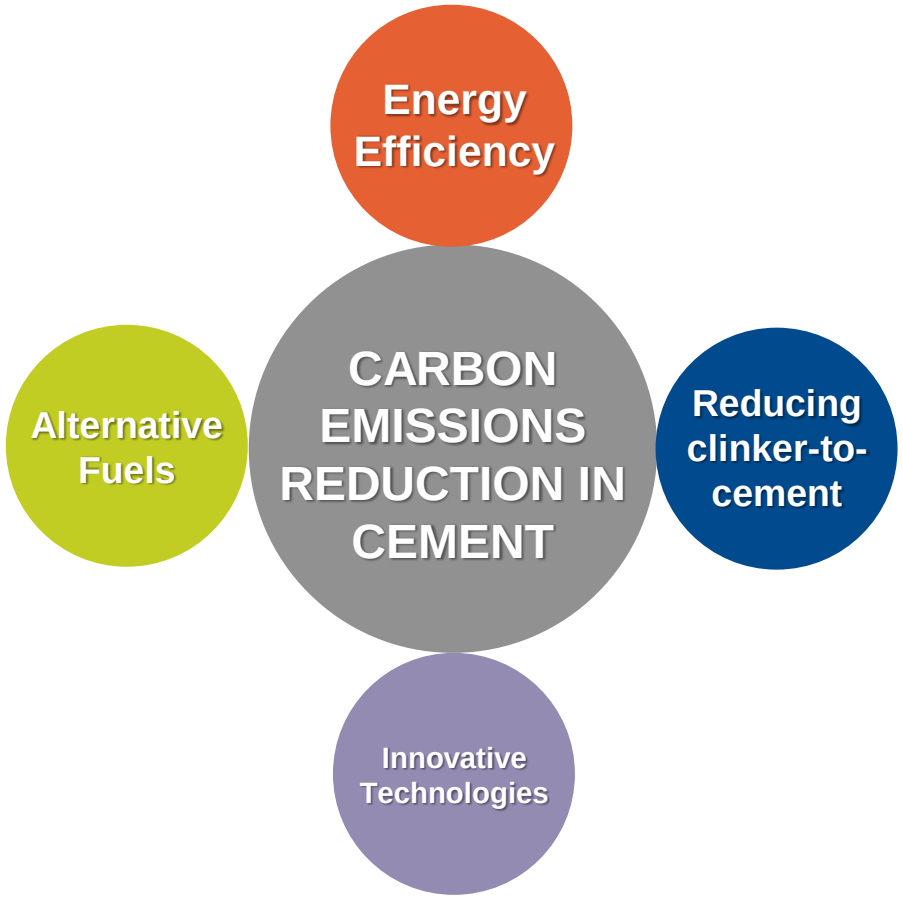
Carbon mitigation in cement industry





IEA 2017

Carbon mitigation in cement industry



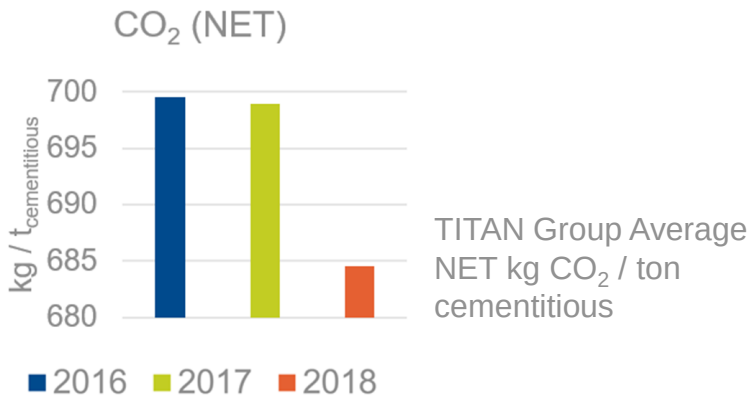
TITAN CO_2 Initiative

Addressing the Carbon Challenge

2020 – 2030 Perspective

Central & Regional Teams

Evaluate Mitigation Options & Implement



R&I activities by TITAN on Innovative Technologies

Low Carbon Cement by TITAN

EU & GR projects

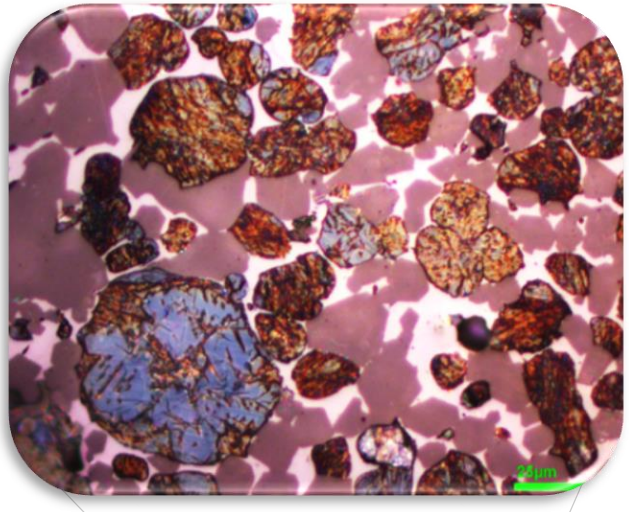
Low-carbon cement by TITAN

Belite Calcium Sulfo-Aluminate

From lab to plant

CO_2 Reduction & Performance

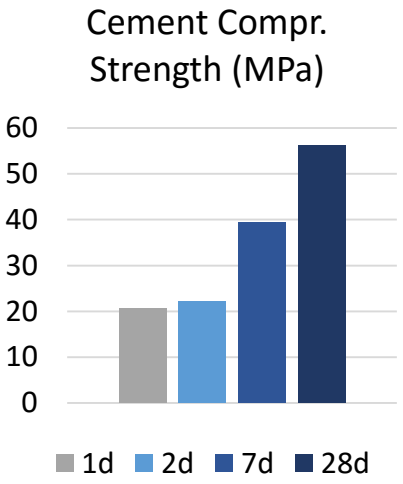
- **30% CO_2 vs. CEM I**
- **Strength >55 MPa (28d)**

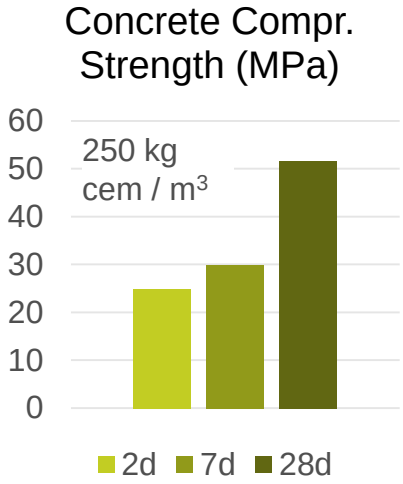


Low-carbon cement by TITAN

Belite Calcium Sulfo-Aluminate

Clinker cooler





Low Carbon Clinker by TITAN

Pyro-process

RECODE

Recycling carbon dioxide in the cement industry to produce added-value additives: a step towards a CO_2 circular economy

SPIRE Research-Innovation Action (RIA)

Partners: 13

Duration: Aug17 – Jul21

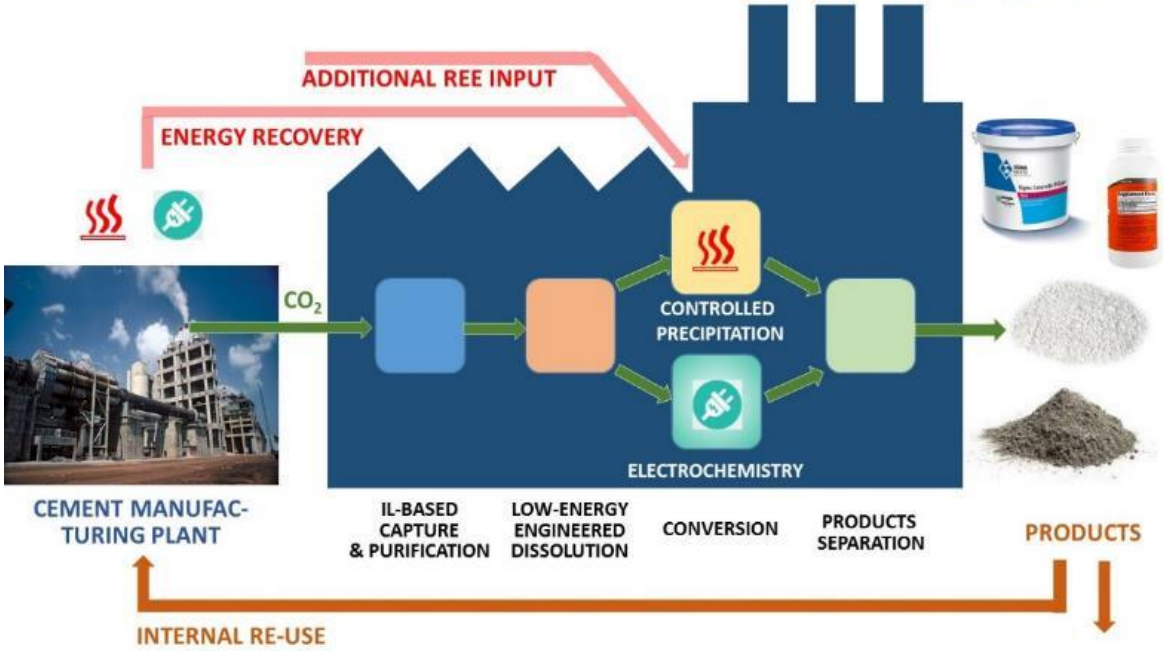
Grant: 7,904,415 €

CCU Demonstration at TITAN

50m³/h flue gas at 99%

CO_2 conversion to:

- Nano-calcite
- Grinding aid & chemicals



Current status

Permitting for demonstration unit

CARMOF

New process for efficient CO_2 capture by innovative adsorbents based on modified carbon nanotubes and MOF materials

H2020 Innovation Action (IA)

Partners: 15

Duration: Jan18 – Dec21

Grant: 5,993,227 €

CC Demonstration at TITAN

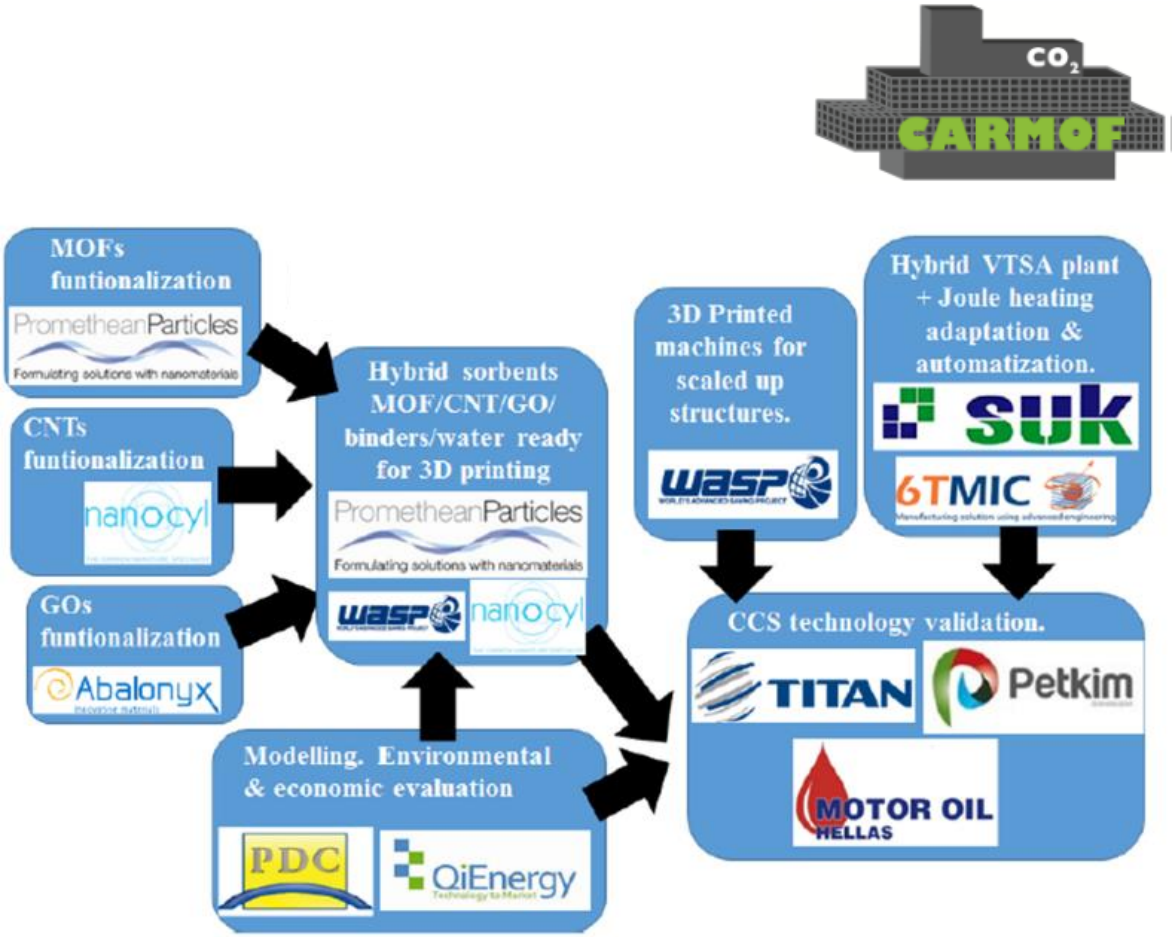
250m^3 CO2 / day at 99%

Novel materials for capture

- 3D printed monoliths
- Nanoenhanced sorbents

Current status

Optimization of capture units



SOLCEMENT

Design of an integrated and low carbon footprint process for limestone calcination using concentrated solar radiation

General Secretariat Research & Technology (GR)

Partners: 4

Duration: Jun18 – Jun21

Grant: 774,508 €

Solar Furnace

Calcination of limestone

- >1,000ºC - 50kWh

Heat Storage System

Current status

Preparation for pilot testing

Solar Furnace at CERTH, Thessaloniki

Concept on scaling up CO_2 Mitigation in SE Europe

RECO$_2$MED by TITAN

REalistic options for sequestering CO_2 in eastern MEDiterranean

Scope

Implement mature CCS in SE European cement sector

Set up and perform CO_2 sequestration in safe and sustainable manner

Project Phases

Phase I (2021-28 - 160 M€)

- Engage stakeholders (state & societal)
- Set-up CO_2 network
- Build CCUS infrastructure (incl. CO_2 storage)

Phase II (2029-35 - 80 M€)

- Operate & monitor CCUS network

Partners

European, US & Asian

Current status

Initial scoping stage

TITAN Cement Plant at Thessaloniki

Thank you

TITAN at a glance

Who we are

TITAN Group is an international cement and building materials producer

Founded in **1902**

Listed in ASE since **1912**

14 cement plants in **10** countries

5,500+ employees

€1,490.1m of annual sales (2018)

Our values

Ήθος - Ethos

Integrity

Ethical business practices

Transparency

Open communication

Delivering results

Shareholder value

Clear objectives

High standards

Know-How

Enhancement of our knowledge base

Proficiency in every function

Excellence in core competencies

Continuous self-improvement

Learning Organization

Willingness to change

Rise to challenges

Value to the customer

Anticipation of customer needs

Innovative solutions

High quality of products and services

Corporate Social Responsibility

Safety first

Sustainable development

Stakeholder engagement

What we do

We provide building materials and related services to our customers worldwide, serving the societal need for safe, durable, resilient and affordable housing and infrastructure

Cement

Ready-Mix Concrete

Aggregates

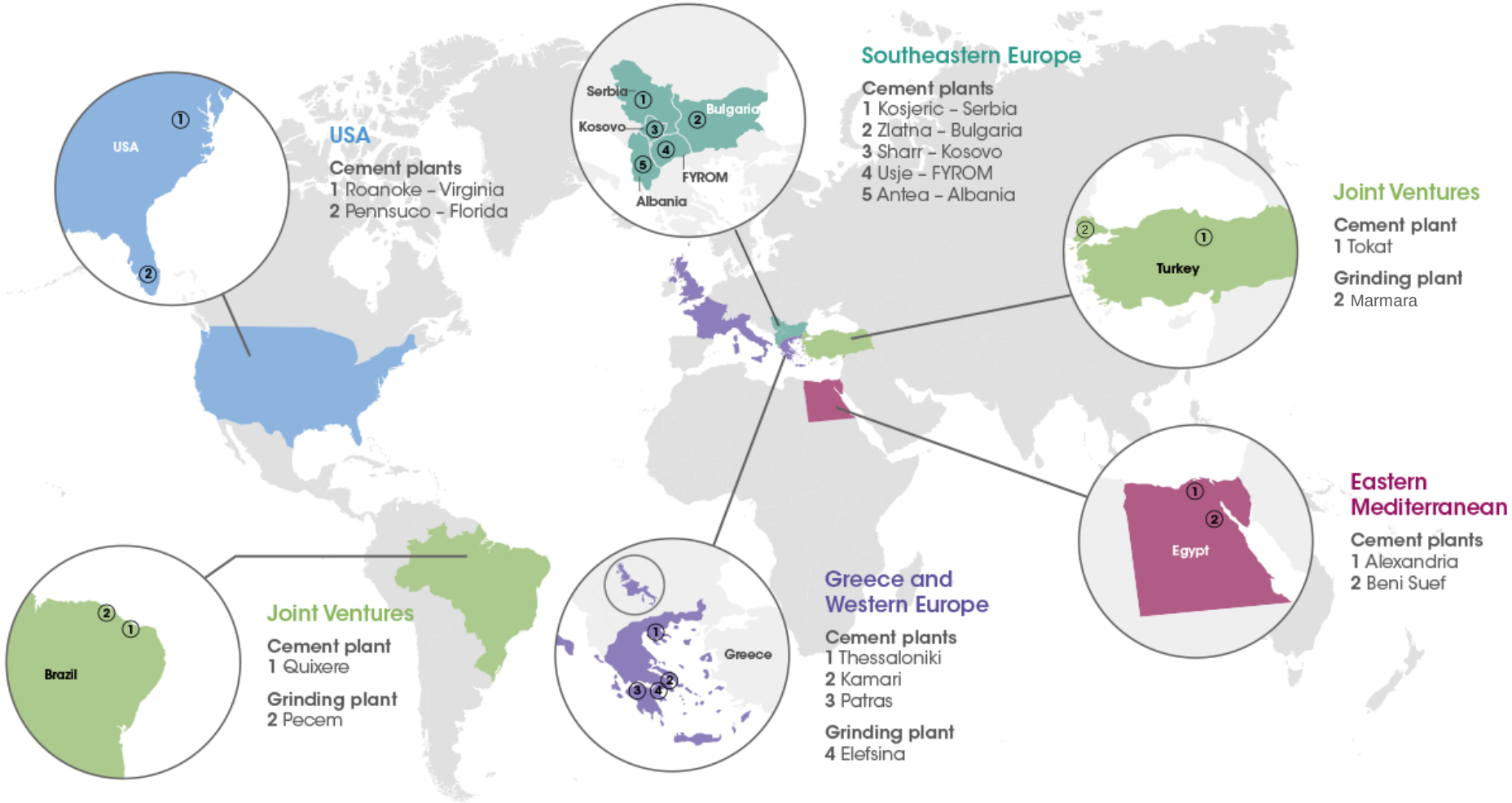
Dry mortars

Fly ash

Building blocks

Waste management & alternative fuels

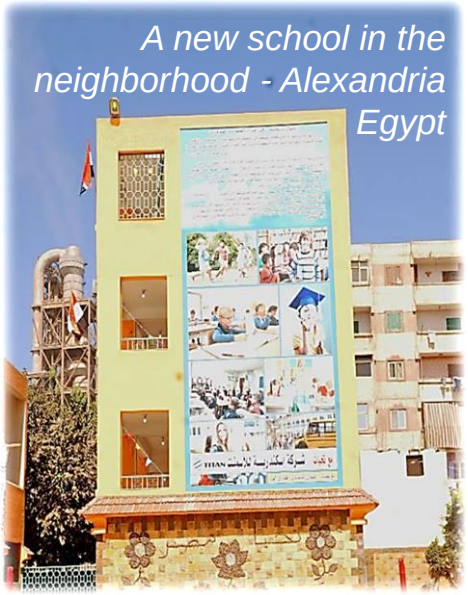
Where we operate



International Collaborations

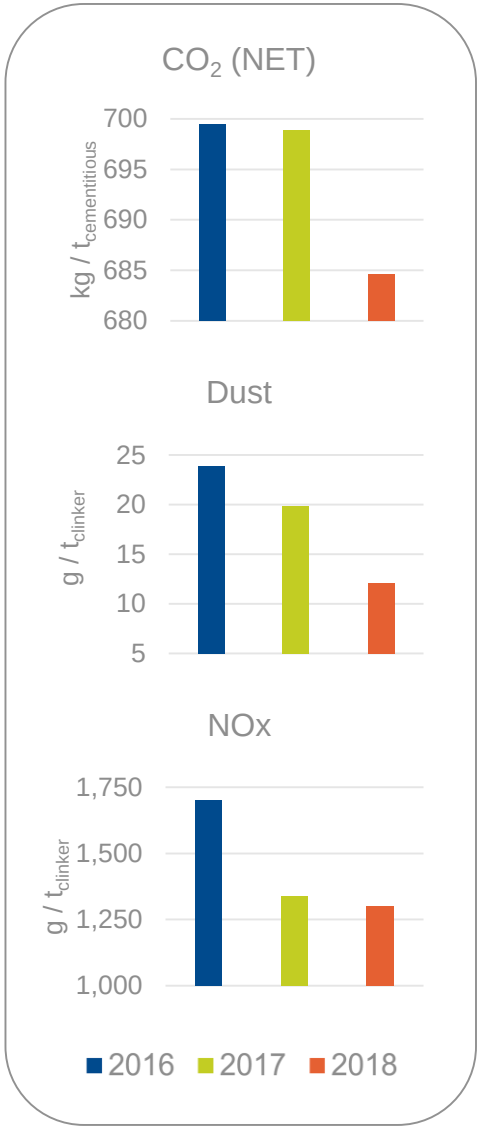
1. Among the first 500 signatories and participant of the **UN Global Compact (UNGC)**
2. Member of **Global Cement & Concrete Association**
3. Core member of the **World Business Council for Sustainable Development (WBCSD)**
4. Core member of **CSR Europe**
5. Industrial Member of **Nanocem**
6. Member of the **European Cement Research Academy**

CSR & Sustainability



A new school in the neighborhood - Alexandria Egypt

Re-design our silos for & with our community – Thessaloniki Greece

Restored quarry with trout pond habitat - Roanoke USA

Community engagement in Kosovo