

# Environmental performance

TITAN is continuously improving its environmental performance, contributing to the sustainable use of natural resources as an active participant in the circular economy.

## Investing in environmental management

Over the last 15 years, TITAN has invested more than €220 million in best available techniques (BAT) to manage its environmental impact and has achieved advanced levels of environmental performance. This has included upgrading and modernizing all plants the Group has acquired, often introducing advanced industry standards to new markets. All our cement plants are certified under the ISO 14001 environmental management system, or, in the USA, a system aligned with local regulatory requirements.

## Achieving long-term reduction of emissions

TITAN's ongoing self-improvement efforts in the field of environmental management have also resulted in reducing air emissions significantly. Between 2003 and 2017, this has resulted in the avoidance of dust emissions of 46,850 tons, equivalent to 12 years' emissions (at 2003 emissions levels). Similarly, we have avoided NOx and SOx emissions of 196,200 tons and 28,770 tons respectively, representing 6.5 years' emissions (at 2003 emissions levels).

In 2017, we continued to drive significant reductions in each of these emissions types. Dust emissions were reduced from 23.9 to 19.9 g/t<sub>Clinker</sub>, NOx emissions dropped from 1,702.9 to 1,340 g/t<sub>Clinker</sub> and SOx emissions declined from 205.6 to 199 g/t<sub>Clinker</sub>.

## Preserving natural resources and biodiversity at our quarries

Regarding life on land, we aim to create a net positive impact on biodiversity in our quarries where possible, by mitigating the impacts of the extraction process. Quarry rehabilitation plans are developed and implemented for the majority of our quarries, aiming to protect and preserve natural capital and resources.

Since 2012, we have elaborated scientific-based methods to assess the status and biodiversity value of our quarries. TITAN has developed and is currently implementing

## Avoided CO<sub>2</sub> emissions

**25m t**

Avoided emissions 1990–2017 (Equivalent to 3.5 years at 1990 emissions levels\*)

## Avoided dust emissions

**46,850 t**

Avoided emissions 2003–2017 (Equivalent to 12 years at 2003 emissions levels\*\*)

## Avoided water consumption

**21.3m m<sup>3</sup>**

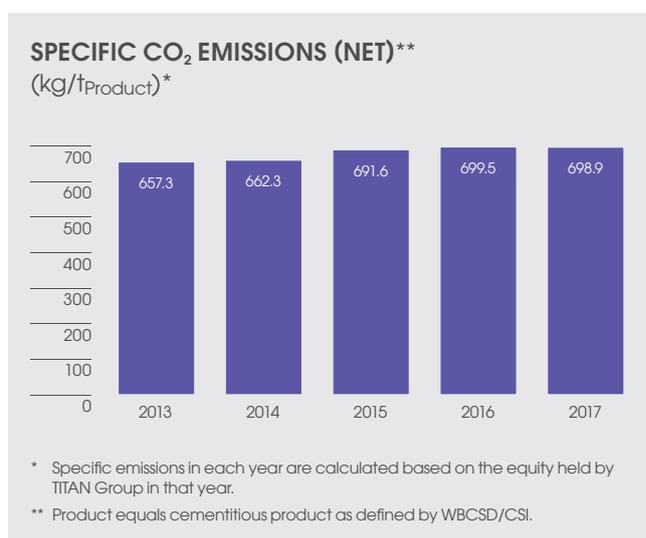
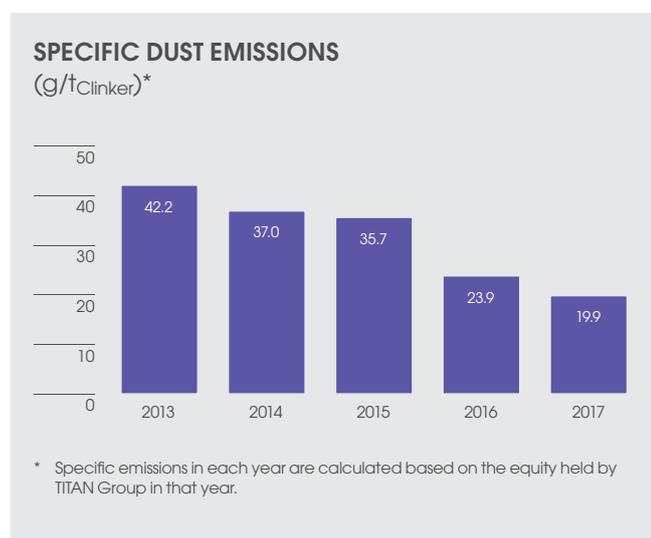
Avoided consumption 2003–2017 (Equivalent to 3.5 years at 2003 consumption levels\*\*)

\* 1990 is the base year for CO<sub>2</sub> emissions, in line with the Kyoto protocol.  
\*\* 2003 is the base year for environmental data other than CO<sub>2</sub> emissions.

Biodiversity Management Plans (BMPs) for eight quarries and is working to complete the assessment process and relevant Biodiversity Management Plans for the remaining two quarries that have been identified as sites of high biodiversity value.

## Optimizing water use across our sites

As a precious natural resource, water is a highly material issue both for our business and our key stakeholders. Since 2010, we have introduced tools such as an Integrated Water Management System (IWMS) to monitor and optimize water use across our sites, and report on water data in a consistent way. All of our operations have active continuous improvement plans and, while in 2017 specific water consumption increased slightly compared to 2016 (from 255.1 lt/t<sub>Cement</sub> to 273.1 lt/t<sub>Cement</sub>) due to increased production needs from our American operations, significant decreases in water consumption have been achieved since 2003.



### Accelerating our efforts to tackle climate change

Climate change is one of the most significant challenges that the world faces, and undoubtedly a material issue for TITAN and its key stakeholders. We have long recognized the importance of improving the energy efficiency of cement production and reducing our carbon footprint with the use of alternative fuels and raw materials.

Since 2003, we have reported on the CO<sub>2</sub> emissions of our cement plants, using 1990 as the base year for comparisons, in line with the Kyoto Protocol. The avoided net CO<sub>2</sub> emissions between 1990 and 2017 were calculated to about 25.0 million tons of CO<sub>2</sub>, equivalent to about 3.5 years at 1990 emissions levels. In 2017, our net specific CO<sub>2</sub> emissions remained at almost the same levels as in 2016 (698.9 kgCO<sub>2</sub>/t<sub>Product</sub> in 2017 vs. 699.5 kgCO<sub>2</sub>/t<sub>Product</sub> in 2016).

In 2017, we launched the Group CO<sub>2</sub> Initiative, in order to develop, prioritize and implement solutions for additional CO<sub>2</sub> reduction. Through collaboration in research and development programs, we are also testing new technologies, including carbon capture and conversion, low-CO<sub>2</sub> binders, calcined clays and cementitious materials with improved insulation properties.

### Supporting the circular economy

TITAN has adopted the circular economy as a material issue for sustainable growth, which promotes the “reduce, reuse, recycle, recover” approach over the traditional “take, make, use, dispose” approach.

STET and GAEA, two TITAN businesses, are good examples of how we put the circular economy at the heart of our operations.

ST Equipment & Technology (STET) is a developer and supplier of specialized processing equipment for the beneficiation of fine particle materials, such as fly ash, which are by-products from coal-burning thermal power plants. The company develops and promotes the use of waterless, energy-efficient and low-emission technologies replacing water-intensive mineral processes.

Our joint venture with the Evolution Environmental Group, GAEA Green Alternative Energy EAD, also supports the circular economy. Originally established in Bulgaria, GAEA works with local businesses to come up with solutions to waste management, environmental protection, waste use and alternative fuel production. It develops “win-win” scenarios that reduce costs, conserve fossil fuels, and enable safe and sustainable waste management.

Since then, GAEA launched GAEA Egypt, which supplies cement plants with fuel made from Alexandria’s municipal solid waste.

In 2017, we increased the use of alternative raw materials to 5.5% of the total materials input for the production of clinker and cement (2016: 5.1%). In Greece and the USA, TITAN continued the implementation of programs to collect ready-mix concrete wastes, as an alternative raw material. More than 80% of the waste produced by Group operations was reused, recycled or recovered through authorized contractors in 2017.

#### Specific dust emissions\*

**19.9 g/t<sub>Clinker</sub>**  
(2016: 23.9 g/t<sub>Clinker</sub>)

#### Specific NOx emissions\*

**1,340.0 g/t<sub>Clinker</sub>**  
(2016: 1,702.9 g/t<sub>Clinker</sub>)

#### Specific SOx emissions\*

**199.0 g/t<sub>Clinker</sub>**  
(2016: 205.6 g/t<sub>Clinker</sub>)

#### Percentage of alternative fuels in the total fuel mix\*

**9.1%<sub>Thermal basis</sub>**  
(2016: 8.6%<sub>Thermal basis</sub>)

#### Externally recycled waste material\*

**255,228**  
metric tons  
(2016: 413,553 metric tons)

\* Figures are calculated based on the equity of the specific year.