

# Cement roadmap targets

2010

2020

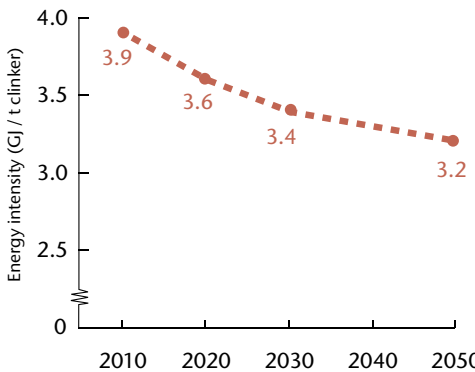
2030

2040

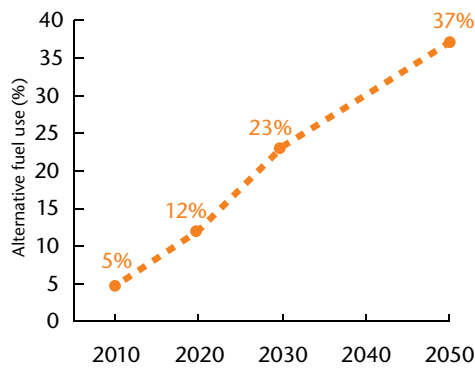
2050

This timeline is based on a set of 38 technology papers developed by the European Cement Research Academy (ECRA) on behalf of CSI, and on IEA modeling and scenario analysis

## Targets for decrease in energy intensity, 2010-2050

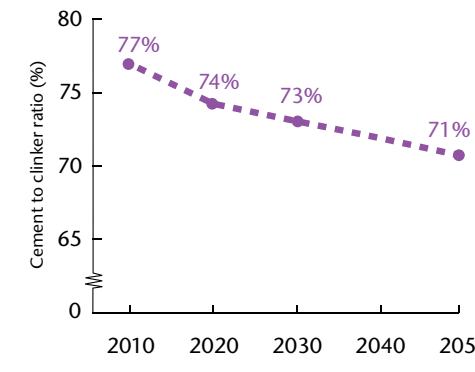


## Targets for alternative fuel use, 2010-2050

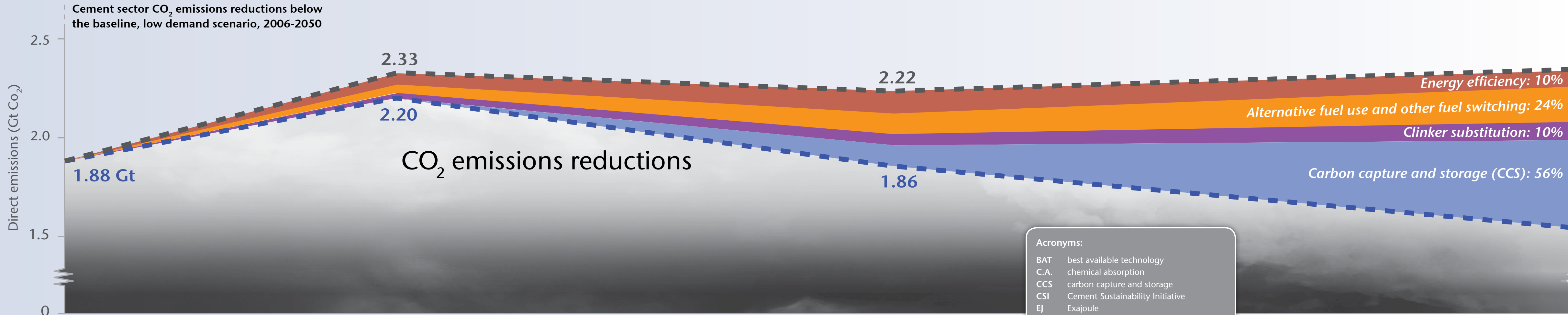


Note: excludes CCS energy use and electricity

## Targets for decrease in cement to clinker ratio, 2010-2050



Note: all figures show global average



### Acronyms:

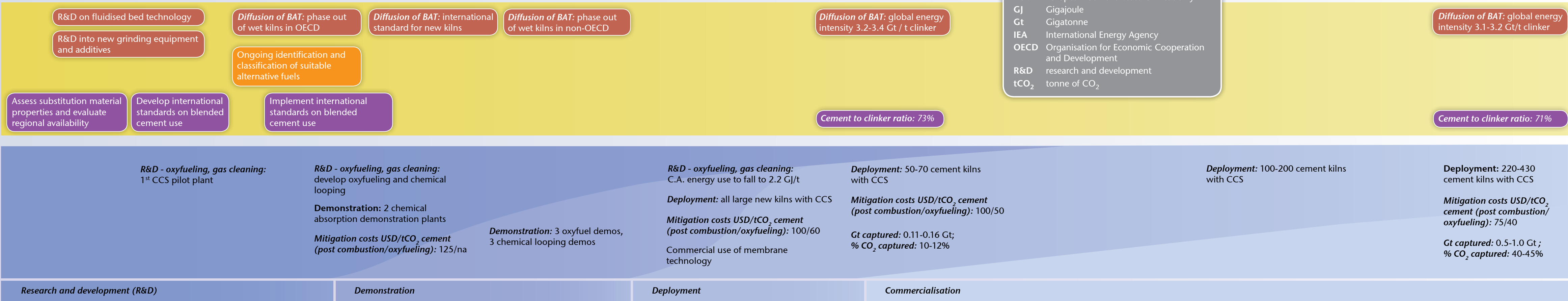
BAT	best available technology
C.A.	chemical absorption
CCS	carbon capture and storage
CSI	Cement Sustainability Initiative
EJ	Exajoule
ECRA	European Cement Research Academy
GJ	Gigajoule
Gt	Gigatonne
IEA	International Energy Agency
OECD	Organisation for Economic Cooperation and Development
R&D	research and development
tCO <sub>2</sub>	tonne of CO <sub>2</sub>

### Energy efficiency

### Alternative fuel use and fuel switching

### Clinker substitution

### Carbon capture and storage (CCS)



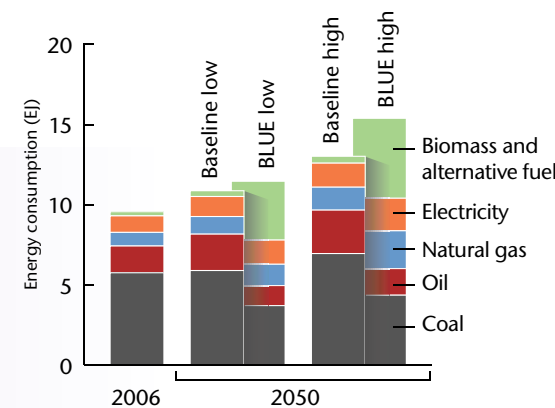
Baseline emissions: 2.34 Gt

Opportunities for CO<sub>2</sub> emissions reductions

BLUE emissions: 1.55 Gt

All of these technologies need to be applied together if the BLUE scenario targets are to be achieved – no one option alone can yield the necessary emissions reductions

## Final energy consumption in the cement sector by scenario, 2006 and 2050



The application of CCS increases energy use and hence in the BLUE scenarios energy use rises compared to the Baseline scenarios

The BLUE scenario examines the implications of a policy objective to halve global energy-related CO<sub>2</sub> emissions in 2050 compared to today's level

The outcomes implicit in the BLUE scenario are consistent with a global rise in temperatures of 2°C to 3°C, but only if the reduction in energy-related CO<sub>2</sub> emissions is combined with deep cuts in other greenhouse gas (GHG) emissions

A halving of global emissions will mean that the cement industry will need to reduce its current emissions by 18% by 2050

Key regional milestones

This roadmap aims to propose tangible policy recommendations for governments around the world and so is written with a broad, global view

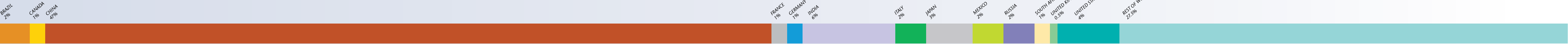
However, it acknowledges the wide differences between regions for many aspects of cement industry technology development and implementation. There are differences, for example, in alternative fuel availability, and in building standards enabling or preventing higher clinker substitution

It is key that nationally appropriate policies should be developed to reinforce this roadmap’s broad recommendations

Alternative fuel shares presented exclude the additional energy requirement for CCS

The CO2 storage figures presented here are based on capture potentials. Additional analysis is needed to verify the storage potential in different regions

Global cement production 2006 (total 100%)



Regional cement production

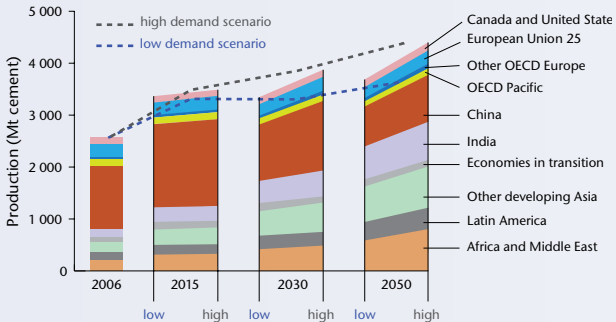
This map and figures show estimated cement production for the years 2006, 2015, 2030 and 2050, and regional breakdown of forecast production under BLUE high and low demand scenarios

Between 2006 and 2050, cement production is projected to grow by 0.8-1.2% per year, reaching between 3,700 megatonnes (Mt) and 4,400 Mt in 2050. This represents a 43-72% increase compared to production in 2006

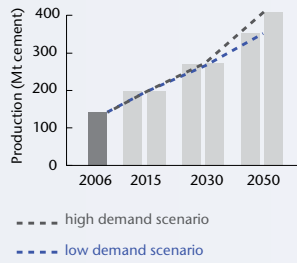
Cement consumption in China, which currently accounts for just under half of total production, is expected to peak between 2015 and 2030, as per capita cement consumption declines towards more developed country levels

Post-2030 global cement production will be fuelled by strong demand growth in India and other developing Asian countries, and in Africa and the Middle East

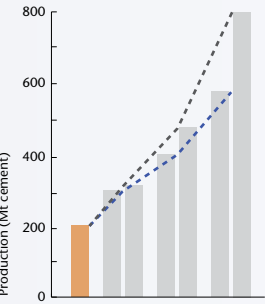
Global cement production: 2006, 2015, 2030 and 2050



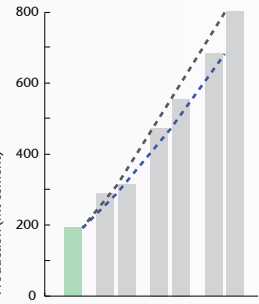
Latin America



Africa & Middle East



Other developing Asia



OECD Pacific

