

TURNING THE TIDE ON  
Climate Change



The Climate Change Challenge  
and the Chemical Industry



“New possibilities are opening up for us, where chemistry and chemical researchers will naturally play their role: bringing their knowledge and expertise to meet new needs.”

**Christian Jourquin**  
President of the European Chemical Industry Council (CEPIC)

## Reducing Greenhouse Gas (GHG) emissions

Climate change is a major challenge facing mankind. Although meeting this challenge raises major difficulties, climate change can be mitigated using the right tools.

We all need to act - governments, businesses and individuals - to change our behaviour and to find innovative solutions. The chemical industry is committed to playing its part.

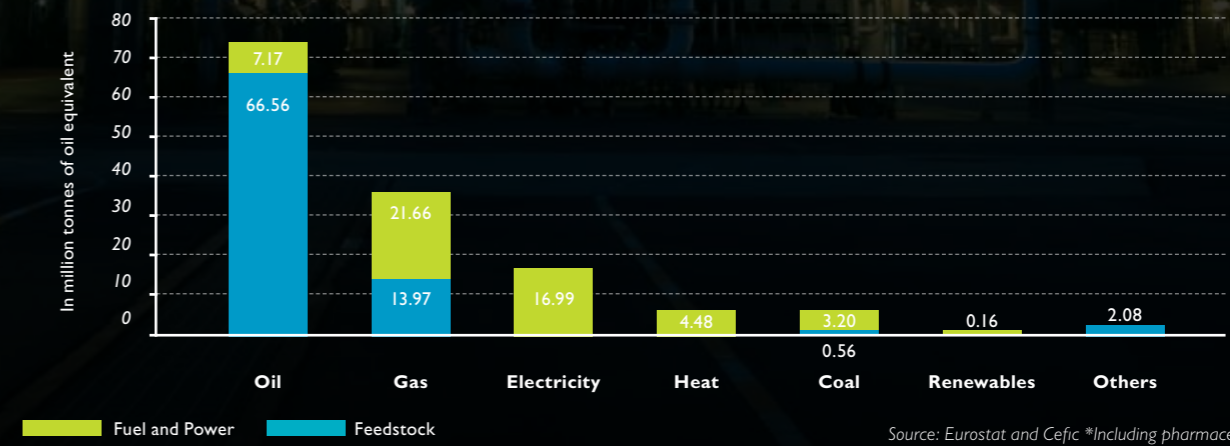


The European chemical industry has an excellent track record over many decades of improving energy efficiency at its manufacturing sites, thereby reducing GHG emissions.

The chemical industry has a long tradition of research and development that produces innovative products and processes, many of which are able to reduce GHG emissions.

To maintain high investment in this area, the chemical industry needs open and fair economic conditions for international trade. Policy makers need to ensure that regions that act first on climate legislation, do not add unilateral costs or other burdens that will hinder the industry from fulfilling its unique role. A vibrant and competitive chemical industry ensures the continuing development of ever more innovative ways of responding to climate change.

EU chemicals\* industry energy consumption by source:



Source: Eurostat and Cefic \*Including pharmaceuticals

Between 1990 and 2006, chemical production in the European Union rose by 70 percent, while total energy consumption remained stable. This meant that the chemical industry cut its energy intensity by 4.6 percent annually. Absolute GHG emissions fell by almost 30 percent over the same time period.





“Through the development of new technologies, the chemical industry has the potential to bring about a major improvement in the energy efficiency of every sector of the economy.”

**Rajendra K. Pachauri**  
Chairman, Intergovernmental  
Panel on Climate Change (IPPC)

## Innovative climate change solutions

The chemical industry has an important role to play, both in reducing its own emissions and providing innovative solutions to reduce emissions in the use of its products, in other words creating the chemistry behind energy and GHG saving products and processes.

The GHG savings enabled by the chemical industry are largely due to its strong R&D capacities. This innovation capacity needs to be maintained to provide tools for a more sustainable future.

## Each year around the world:

In order to create the right environment to enable sustainable development, the chemical industry needs:

- A global carbon framework which covers all regions and sectors;
- To focus on the largest, most effective and lowest cost abatement opportunities; and
- A push towards energy efficiency and support for the development and implementation of new technologies.

**Insulation foams in buildings save 2,400 million tonnes of GHGs**



New chemistry is enabling better insulation, which save energy and reduce greenhouse gas emissions. Efficient insulation can reduce energy costs by as much as 60%.

**Chemical products for vehicles save 230 million tonnes of GHGs**



Emissions can be reduced through lighter plastic parts which reduce a car's weight, tyres which create less emissions and gasoline and diesel additives which improve energy efficiency.

**Innovative lighting saves 700 million tonnes of GHGs**



Modern compact fluorescent lamps offer more effective lighting and a longer lifetime compared with incandescent bulbs.

**Agrochemicals save 1,600 million tonnes of GHGs**

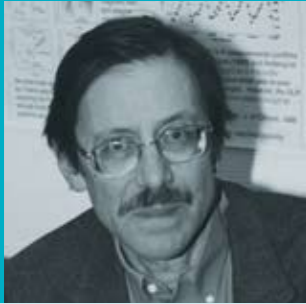


Appropriate use of chemical fertilizers and crop protection products help increase world food production, while reducing the need for land-use change.

**Chemical products in wind and solar energy save 100 million tonnes of GHGs**



Chemical products enable much larger rotor blades and higher efficiency photovoltaic cells, essential steps on the road to cost effective renewables.



“The chemical industry can offer significant CO<sub>2</sub> savings through its products that are then used in every economic sector.”

**Professor Robert S. Kandel**  
Senior Scientist, Laboratory of Dynamic Meteorology

## Want to learn more?

What is really meant by climate change?  
What is the role of human activity?  
What can the chemical industry do to play its part?

In his book *“Turning the tide on climate change”*, Robert Kandel, a senior scientist who has spent years working on climate change, explains the scientific rationale that led the IPCC to the consensus that reinforcement of the greenhouse effect by human activities is the dominant cause of current climate change. He also looks at the risks of continued accelerated climate change. Kandel concludes by building a bridge between this and possible solutions from the chemical industry for all of us.



## Innovations for greenhouse gas reductions

The International Council of Chemical Associations (ICCA) published a report on the global carbon life cycle assessment of chemical products in July 2009.

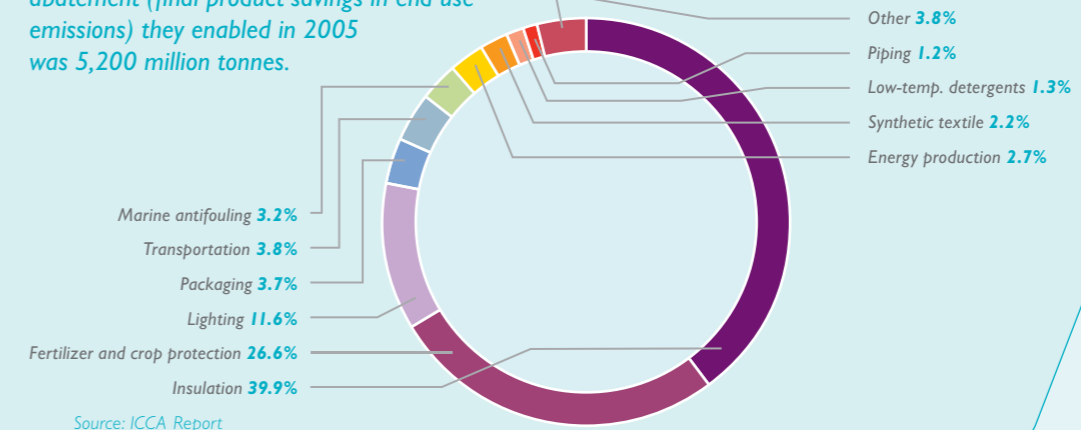
The report is based on independent analytical work done by McKinsey & Co. and validated by the Öko Institute.

The ICCA report found that for every unit of greenhouse gases emitted by the global chemical industry to produce chemicals, the industry enabled more than two units of emission savings via the products and technologies provided to other industries or users.

The study also found that, by 2030, the ratio of GHG emission savings to emissions could increase to more than 4:1 (18,500 million tonnes), based on actions that should be taken by industry, stakeholders and policymakers.

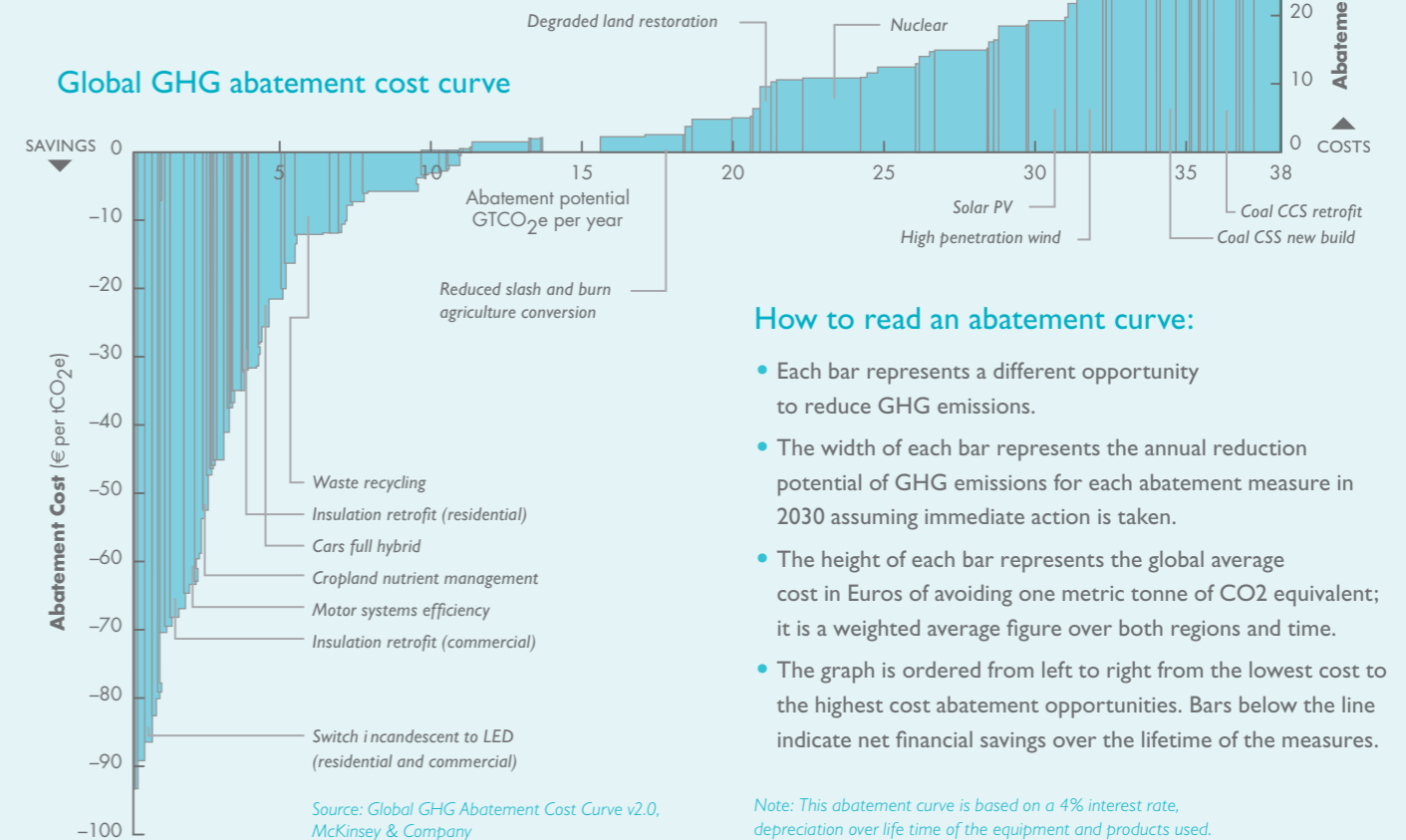
For further information please visit [www.icca-chem.org](http://www.icca-chem.org)

Chemical industry applications and the net abatement (final product savings in end use emissions) they enabled in 2005 was 5,200 million tonnes.



Source: ICCA Report

## Global GHG abatement cost curve



Source: Global GHG Abatement Cost Curve v2.0, McKinsey & Company

## How to read an abatement curve:

- Each bar represents a different opportunity to reduce GHG emissions.
- The width of each bar represents the annual reduction potential of GHG emissions for each abatement measure in 2030 assuming immediate action is taken.
- The height of each bar represents the global average cost in Euros of avoiding one metric tonne of CO<sub>2</sub> equivalent; it is a weighted average figure over both regions and time.
- The graph is ordered from left to right from the lowest cost to the highest cost abatement opportunities. Bars below the line indicate net financial savings over the lifetime of the measures.

Note: This abatement curve is based on a 4% interest rate, depreciation over life time of the equipment and products used.

**Based on the book  
'Turning the Tide on Climate Change'  
by Robert S Kandel**

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