

Climate targets and their effects on the thermo process industry



The term "climate targets" is normally used to refer to limiting global warming to a maximum of 2 K and a reduction of between 80 and 95 % in greenhouse gas emissions by 2050. This article considers the political framework and the resulting possible effects on thermo process industry.

WHAT IS THE CURRENT POLITICAL FRAMEWORK?

At the UN Sustainable Development Summit of heads of state and heads of government held in New York in September 2015, climate protection was defined as one of the 17 Sustainable Development Goals and enshrined in international law for the first time. In the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) concluded at the end of 2015, the international community set itself the target of limiting global warming to significantly below 2 °C. The aim is to limit global

warming to no more than 1.5 °C. More than 195 countries have now signed the agreement, 153 of which have ratified it.

In order to achieve the goal of limiting global warming, experts consider that it will be necessary to reduce global greenhouse gas emissions to zero between 2015 and 2050.

The European Council has corrected the key European climate policy objectives for the year 2030. In addition to reducing greenhouse gas emissions by at least 40 % (compared with 1990) and the use of renewable energy sources to cover at least 27 % of total energy demand, energy efficiency is also to be increased by at least 27 %.

In the long term, i. e. up to 2050, the EU has set itself the goal of reducing greenhouse gas emissions by between 80 and 95 % compared with 1990 levels.

The greenhouse gases include CO₂, CH₄, N₂O, PFC, HFC, SF₆ and NF₃. Greenhouse gas emissions are expressed in CO₂ equivalents.

All the EU member states must submit national action plans



stating their contribution to the achievement of European climate protection targets by 2017. Germany has already met this requirement by submitting the "Klimaschutzplan 2050".

WHAT ARE THE EFFECTS OF THE CLIMATE PROTECTION TARGETS THAT HAVE BEEN SET?

All greenhouse gas emitters (energy industry, traffic, industry, households, the industrial and commercial sectors, agriculture and others) are called upon to make their contribution to meeting the climate change targets. The percentage requirements for the various sectors are governed by national legislation. The assignment of emissions to emitters is based on the source principle (measured at the source) or by the polluter pays principle. Emissions from combustion processes, industrial processes and power generation by manufacturing industry are assigned to the "industry" sector.

The following analysis is limited to carbon dioxide, the major greenhouse gas emitted by industry.

There are industrial production processes which emit considerable amounts of CO₂ for process reasons. Examples include blast furnace processes for steel production and combustion processes for cement production. From the point of view of environmental policy, the operators and manufacturers of such plants are called upon to significantly improve their processes with respect to CO₂ emissions or to develop or use processes with lower CO₂ emissions. Especially in this segment, academic research will be extremely important and will bear considerable responsibility.

As regards to combustion processes, it can be assumed that political restrictions will reduce the combustion of brown coal, hard coal, oil and natural gas to zero and that new plants of this type will no longer be approved in the long term. If all the possibilities of waste heat recovery are exploited, natural gas combustion could still be accepted (with a greenhouse gas reduction target of 80 %). In combustion processes, the aim is to use synthetic, climate-neutral gas and liquid fuels (bio-fuels).

Electric heating is considered as an alternative by sustainability experts provided that power is generated from renewable sources

and is available at all times and places.

Assuming that it will probably only be possible to obtain official permission for plants using electric heating or biofuels in the future, plant manufacturers will need to check which processes and thermo process plants can be converted to electric heating, hydrogen and methane from renewable sources. Initially, it will also be essential to forge ahead with energy efficiency improvements and the conservation of resources as these approaches will still be extremely important for the achievement of climate change targets.

In addition to these technical changes and adaptations which will very probably be required in order to reduce greenhouse gas emissions, plant manufacturers must of course also consider the economic aspects of these developments and the resulting changes for their customers and for final customers including industrial and commercial companies as well as private consumers.

On this basis, politicians need to search for tools which are appropriate for achieving climate change targets and take into consideration the interests and possibilities of industry. CECOF supports technology-neutral requirements. At the European and international level, general CO₂ pricing at source should be introduced in a way which supplements and is compatible with the emissions trading system (ETS). The greatest possible effect can be achieved at the point where CO₂ is produced.

These considerations are the result of many discussions and meetings with plant manufacturers, operators, scientists and sustainability experts. In conclusion, it can be stated that manufacturers of thermo process plants and plant components will be in a position to master the challenges of the future and to make a significant contribution to the achievement of greenhouse gas emission targets if the technologies used are changed over at an early stage.

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