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BEST AVAILABLE TECHNIQUES IN CERAMIC INDUSTRY: ENHANCING ENVIRONMENTAL PERFORMANCE AND IMPROVING ENERGY EFFICIENCY

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Introduction

The Russian Federation has been planning to transit to the Integrated Permitting and Best Available Techniques since the late 90s. Learning from the experience of the European Union, Russian authorities set up categories of activities (industries), which have to transit to the Integrated Permitting system in the coming years. Ceramic manufacturing sector present in almost all Russian regions appeared to be included in the list of such industries.

Research

After the breakdown of the Soviet Union in 1991, ceramic manufacturing industry experienced a rapid decrease of production; it began growing again only after 2000 (Fig. 1 and 2). By 2007 sub-branches manufacturing ceramic tiles and sanitaryware for the construction sector managed to modernise significantly. Results of our analysis of consumption and emission levels typical of Russian and foreign companies proves that newer installations show results similar to those demonstrated by EU companies regulated by the Directive 2010/75/EU, while older plants often remain inefficient with environmental emissions being sometimes 2-3 times higher than those of the new installations (Fig. 3 and 4).

To gradually introduce Integrated Pollution prevention and Control procedures in Russia and wider promote Best Available Techniques (BAT), it was suggested developing and implementing national BAT standards. In particular, such standards were developed for the production of bricks and tiles and officially approved by Russian authorities.

By nature, national BAT standards for the production of bricks and tiles are somewhat similar to BAT Conclusions published by the European Commission, but contain descriptions of BATs as well as energy efficiency and environmental performance parameters identified for Russia.

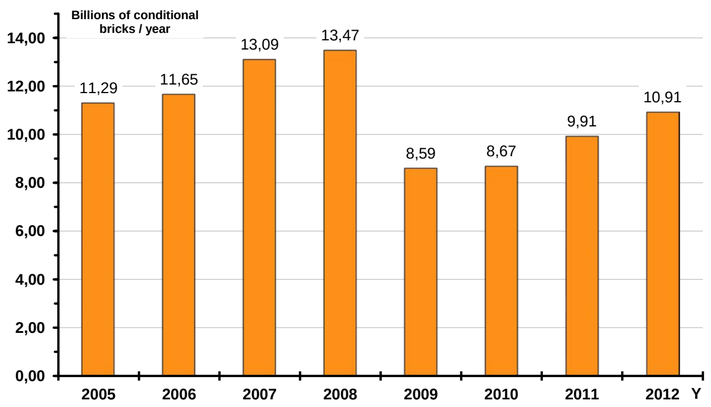

Figure 1. Manufacture of ceramic bricks

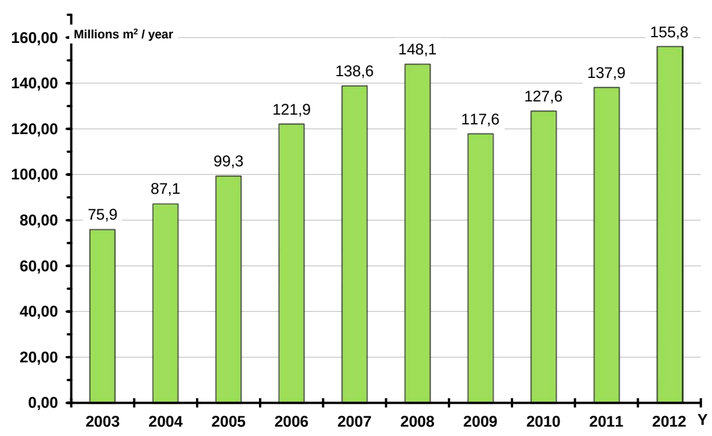

Figure 2. Manufacture of ceramic tiles

Results

Results of the comparative study of Russian ceramic industries show that leading tile and brick companies have been gradually improving not just quality of their products but also environmental performance and energy efficiency of their installations. It is demonstrated that leading enterprises implement BATs for he production of bricks and tiles. To demonstrate their voluntary implementation of new methods. They can undergo certification process and receive conformity assessment certificate issued by the National Association of Builders.

BAT standards are being used in practice for benchmarking purposes> some standards are also considered in the Environmental Impact Assessment procedures to compare technological and technical alternatives of new projects. In any case, for Russian industries BAT standards are instruments of voluntary demonstration of conformity with stricter technological requirements to environmental performance and energy efficiency.

The National Association of Builders following Life Cycle Analysis and Green Building principles showed its interest in introducing a voluntary certification scheme for construction materials industries in Russia. Such scheme was developed back in 2012, while the first conformity assessment certificate was issued in June 2014.

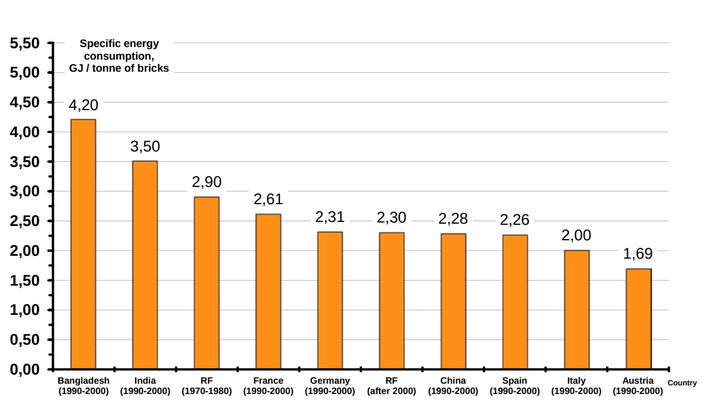

Figure 3. Specific energy consumption in the brick production, GJ / tonne of bricks

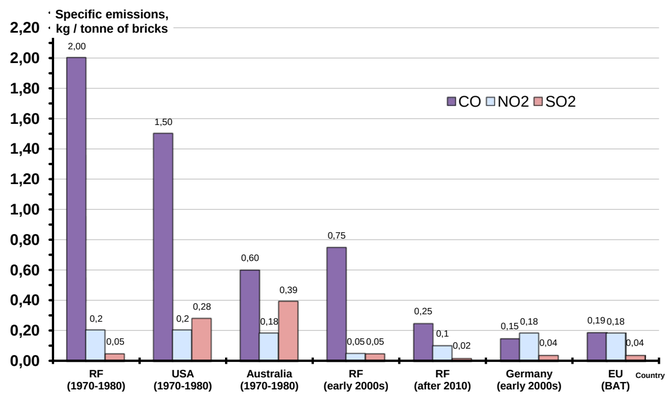

Figure 5. Specific emissions in the brick production, kg / tonne of bricks

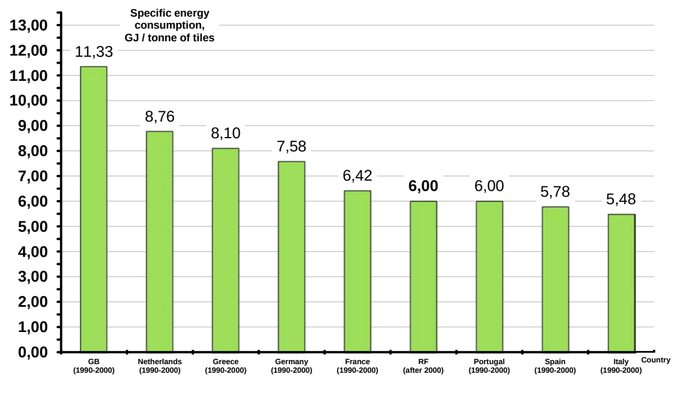

Figure 4. Specific energy consumption in the tile production, GJ / tonne of tiles

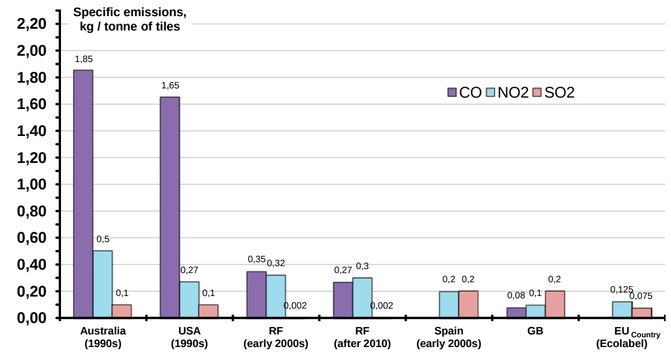

Figure 6. Specific emissions in the tile production, kg / tonne of tiles

Conclusions

Driven by market forces, Russian ceramic enterprises have been modernising technological processes often installing equipment produced in the European Union. Such sub-branches as production of tiles and sanitary ware have been leading in this field, while manufacturers of bricks divided into two large groups: (1) older (traditional) industries operating plants erected several decades ago and (2) newer (often international) installations implementing Best Available Techniques and showing high energy efficiency and environmental performance indicators.

While preparing for transiting to the Integrated Permitting system, ceramic manufacturers can use information of National Standards on Best Available Techniques prepared similarly to BAT Conclusions known in the EU. For leading industries, these standards open opportunities for the voluntary demonstration of compliance with BAT requirements. For older enterprises BAT Standards serve as sources of information on Best Available Techniques (especially low cost ones) that can be used to gradually improve their environmental performance and energy efficiency.

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