ABSTRACT

The Centre for Best Available Techniques (BAT) is founded by the Flemish Government, and is hosted by VITO. The BAT centre collects, evaluates and distributes information on environmentally friendly techniques. Moreover, it advises the Flemish authorities on how to translate this information into its environmental policy. Central in this translation is the concept “BAT” (Best Available Techniques). BAT corresponds to the techniques with the best environmental performance that can be introduced at a reasonable cost.

This report gathers the cross-sector BAT to prevent and limit PFAS emissions to air and recommendations are formulated for general environmental conditions in VLAREM II, for specific environmental conditions in permits and for further research for knowledge building and development of techniques.

Since the Flemish PFAS crisis, emissions of and pollution with PFAS are a hot topic in Flanders. In recent years, much knowledge has been gathered about environmental and health effects of certain PFAS, about their presence and spread in soil and water, and techniques to treat these contaminations.

The knowledge on air emissions is currently more limited, both when it comes to appropriate techniques to prevent or limit emissions, and the effects of these emissions on the environment.

This BAT-study therefore starts with an overview of existing Flemish, national and international environmental leglislation and policy relevant for PFAS air emissions.

Next to that, the report collects information on PFAS properties relevant for air emissions, and known and potentially relevant sources of PFAS air emissions in Flanders, with a focus on activities requiring an environmental permit. Only for very few activities there is, mostly preliminary, quantitative information on emission levels. However, the number of activities with potentially relevant air emissions is large and very diverse, and spreads across whole value chains and life stages of products, byproducts and wastes.

Because of the current lack of detailed information, techniques to prevent or limit PFAS air emissions are described at a general level, ranging from an inventory of PFAS risks, limiting the presence of PFAS, process-integrated measures at the source and monitoring of emissions, to extraction and treatment of waste gases. The techniques are consequently evaluated to reach a selection of BAT, with explanation of the circumstances in which they are BAT, and when they are not.

The recommendations for the general environmental conditions in VLAREM II are based on this. They include an inventory of PFAS risks and investigation into limiting the presence of and minimising emissions of PFAS of very high concern. Next to that, there are recommendations for the periodic measurement and monitoring requirements, depending of the environmental risk.

Finally, there is a proposal for general air emission limit values for PFAS of very high concern. This should be seen as a preliminary, relatively wide, ‘safety net’, which needs to be complemented by an assessment of the contribution to the immission and deposition in the surroundings. Furthermore, the safety net is not an alternative for the investigation into minimising emissions of PFAS of very high concern; they are complementary. The BAT-study proposes a methodology for the assessment of the immission. For the assessment of the deposition, the current knowledge is insufficient.

In this study (update until October 2023), as much as possible relevant and current information has been gathered. It is however clear that there is still a large knowledge gap concerning many aspects of PFAS air emissions and treatment techniques, and thus also the emissions policy. Therefore, an extensive list of recommendations for improving the knowledge basis and development of techniques has been included.

It should be emphasised that the proposed norms are preliminary and incomplete, and is to be complemented by an assessment of the deposition contribution. An important recommendation for further research is therefore to review and/or complement these norms as knowledge further develops.

The information collection, BAT selection and recommendations were established on the basis of, among other, a literature study, intensive consultation with representatives of individual companies and federations, technology suppliers, specialists from government administrations and engineering firms, screening of environmental permits, comparison with foreign policy and company visits. The formal consultation took place in a steering committee.