SUMMARY

The BAT Knowledge Centre, founded by the Flemish Government and hosted by VITO, is tasked with inventorying, processing and disseminating information on environmentally-friendly techniques. The knowledge centre must also advise the Flemish authorities on implementing Best Available Techniques (BAT). This report defines the BAT for domestic wood heating.

Emissions from domestic wood heating have a negative impact on air quality, especially during the heating season. This may have health effects, both for users and in the vicinity. It may also cause odour and smoke nuisance for local residents. To solve these problems, the Green Deal 'Domestic Wood Heating' was signed in Flanders in 2018 (https://omgeving.vlaanderen.be/green-deal-huishoudelijke-houtverwarming). The BAT study is being prepared as part of this Green Deal and more specifically within the framework of the following 2 actions:

- research into potential technological improvements for new appliances (action 1.2.2)
- research into the feasibility and potential of retrofitting old, polluting combustion appliances (action 1.1.2).

The study focuses in the first place on techniques (BAT) for the **design of new appliances**. Appliances are designed to comply with the applicable emission and energy efficiency requirements under standardised test conditions. However, environmental performance in real-life conditions of use (varying combustion conditions which are not always optimal) will be lower than the performance measured in labs under standardised test conditions. The BAT evaluation therefore also examines techniques that eliminate the influence of (incorrect) user behaviour as much as possible (automation) so that the performance in actual conditions deviates less from that under standardised test conditions. The BAT evaluation was carried out for different appliance types: wood stoves (logs), pellet stoves, mass stoves, wood-burning boilers (logs) and pellet boilers, also taking into account the intended application and the profile of the user (e.g. number of hours that the appliance is intended to be used, time/effort the user is willing to invest in good heating practice, maintenance, etc.). For an overview of the techniques that have been evaluated as BAT for each of these appliance types, please refer to Table 32. No techniques (BAT) are available for open fireplaces to optimise the combustion process and/or reduce emissions. This means that emissions are very high and energy efficiency is low. For this reason, the use of open fireplaces is not considered as BAT.

Possible **retrofitting of existing appliances** was also investigated. Two important retrofitting options are the installation of an ESP (electrostatic precipitator) and the installation of a catalyst. Both techniques can help to reduce emissions from existing appliances. Compared to the complete replacement of the existing appliance by a new, more efficient unit, these measures have benefits as well as disadvantages, as indicated in Table 34. This means that whether or not they are regarded as BAT depends on the situation and that the replacement by a new appliance must always be assessed.

In addition to measures for the design of new appliances and the retrofitting of old appliances, the study also focuses on measures for the **installation and use** of appliances, and for the **maintenance and service/inspection** of appliances and flue gas pipes. These measures are of great importance to reduce the environmental impact of domestic wood heating but are not investigated in so much detail in this study. They are the subject of other actions in the framework of the Green Deal 'Domestic Wood Heating'.

The BAT selection and advice was based on literature research and consultation with representatives of the federations, suppliers, specialists from the public administration and other experts. Formal consultations took place in a steering committee whose composition is given in Appendix 1.