First inventory of unintentional persistent organic pollutants emission in Antarctica

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**Information paper submitted by the Republic of Belarus**

***Introduction***

Persistent organic pollutants (POPs) are a group of toxic chemical substances which are considered a global issue and are regulated by Stockholm Convention on POPs. Despite of long history of POPs investigation in Antarctica (Bargagli, 2008; Bengtson Nash, 2011; et al.), further research of these pollutants is important. In particular, local sources and emissions within Antarctica have been identified among the priority research to cover the gaps and inform the policy making in the framework of the Madrid Protocol (SCAR 2021).

The Information Paper presents the results of the first inventory of unintentional POPs emission from anthropogenic sources in Antarctica for modern period and preliminary estimate for the late 1980s.

***Methods and Results***

Emissions of dioxin/furans (PCDD/Fs), polychlorinated biphenyls (PCBs) and hexachlorobenzene (HCB), which may be formed during waste and fuel combustion at scientific stations, has been assessed.

Methodology of POPs emission assessment used for this study is based on activity data and emission factors. To assess the POPs emission in Antarctica the following tasks were solved: identification of POPs emission sources in Antarctica; data collection of human activities characteristics; preparation of input activity data in required format; and selection of specific emission factors. Fuel combustion by diesel generators and boilers, motor vehicles as well as waste incineration were considered as modern sources of POPs emission for numerical evaluation. Waste burning in the past was taken into account.

Assessment of PCDD/Fs emission in different media, as well as PCBs and HCB in air has been done. It is shown thatwaste incineration makes the greatest contribution to total POPs emission in Antarctica for modern period and open burning of waste was the main anthropogenic source of these pollutants in late 1980s. Over a 30-year period air emissions of dioxins / furans, PCBs and HCB have decreased dramatically, that demonstrates the effectiveness of the Protocol on Environmental Protection. Further measures on POPs emission reduction should be aimed at improving incineration practices, the use of afterburners, dust and gas collection equipment.

***Conclusion***

For reduction of uncertaintiesof POPs emission estimates improvement of emission sources in Antarctica data collection especially on waste combustion would be useful. Establishment of emission reporting in the framework of Antarctic Treaty system is an important step towards better management of POPs emission sources in Antarctica.

This work was implemented in the framework of the National Antarctic Program of Belarus for 2021-2025. Results of the inventory were published in the Advances in Polar Science (Kakareka, Kukharchyk, 2022).

**References**

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