1 Context of study

RECYC-QUÉBEC is concerned about the issue of managing the end-of-life of disposable masks that have been part of daily life since the start of the COVID-19 pandemic. Several projects have been initiated and there are questions about the proper practices to promote. Determining these practices may be useful to the health sector outside of the context of the COVID-19 pandemic.

2 Aim of the study and proposed application

The purpose of the study is to conduct a life cycle assessment (LCA) to assess the environmental profiles of three types of disposable masks (procedure, N95) throughout their life cycle, by comparing three end-of-life management options:

- Recycling in Quebec;
- Incineration with waste-to-energy in the United States;
- Disposal in Quebec landfills.

The purpose is not to compare the masks with one another, since they are often not used in the same settings, but to compare the various end-of-life scenarios for each mask type.

The study results will be used to improve understanding of the environmental footprint of disposable masks, identify hot spots and potential issues related to their life cycle (especially at end of life), and determine potential areas of improvement. The results will be disclosed publicly by RECYC-QUÉBEC, in particular so that the information can be accessible to the different workplaces that have had to make choices regarding the end-of-life of these disposable masks.

3 Product under study

The three types of disposable masks are illustrated below.

![Procedure mask](image1)

![N95 mask](image2)

The procedure mask is made up of three parts: a filtering section consisting of three layers of polypropylene, a nose clip made of aluminum, and polyester straps. Other materials may be used for the nose clip and the straps and may be subject to a sensitivity assessment in a later phase of the study. The mask that was assessed was made in China, in order to reflect the most common origin in government supplies in Quebec (note: this does not take into account possible procurement contracts that may have been signed since the start of the study).
4 Method and environmental indicators

The method used to assess the potential environmental impacts of the systems being studied is IMPACT World+, which provides two levels of indicators: midpoint impacts, which are related to different environmental issues such as climate change, and damages impacts, which represent potential final consequences of all these issues on human health, the quality of ecosystems, and resources.

As the aim of the project was to conduct a comprehensive environmental profile, the two damages impacts – Human health and Ecosystem quality – were studied, as well as the two midpoint indicators, Fossil fuel and nuclear energy use and Mineral resource use. As special attention was given to issues related to the carbon footprint, the Short-term climate change midpoint indicator (PRG100, used by political consensus to assess carbon footprints) was also reviewed.

5 Preliminary results

The aim of the preliminary study results was to draw up a comparison between three end-of-life scenarios for a procedure mask (recycling, incineration with waste-to-energy, disposal at landfill sites).

The preliminary results indicate that recycling is the end-of-life scenario with the least potential impact for all of the environmental issues and impacts being considered.

NOTE: At this stage of the project, the results are preliminary. The results and trends may change between now and the final version of the LCA report.

6 Next steps

The next step in the study consists in refining the model and including end-of-life scenario comparisons for the other masks (N95). All the results should be available for public release in winter 2021–2022 and include a critical review by an independent scientific committee.