

# Strategies for reducing the use of greenhouse gases from particle detectors operation at the CERN LHC experiments

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A wide range of gas mixtures is used for the operation of the gaseous detectors at the CERN LHC experiments. Some gases, as C<sub>2</sub>H<sub>2</sub>F<sub>4</sub>, CF<sub>4</sub>, C<sub>4</sub>F<sub>10</sub> and SF<sub>6</sub>, are greenhouse gases (GHG) with high global warming potential and therefore subject to a phase down policy.

The reduction of GHG emissions is of paramount importance for CERN, which has identified four different strategies.

The first strategy is based on the optimization of the gas mixture recirculation plants already in use. The second approach is the recuperation of used gas mixtures followed by separation of the GHG for its re-use. Several R&D are ongoing to evaluate this possibility and prepare the design of final systems. A third approach is making use of industrially available solutions for disposal of GHGs. Finally, the search of new eco-friendly gases is object of many R&D programs by the detector communities.

The four strategies will be compared by considering investment required, return benefit and technological readiness.

## Funding information

**Authors:** GUIDA, Roberto (CERN); MANDELLI, Beatrice (CERN); RIGOLETTI, Gianluca (Universite Claude Bernard Lyon I (FR)); CORBETTA, Mara (Universite Claude Bernard Lyon I (FR))

**Presenter:** GUIDA, Roberto (CERN)

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