

SHORT ABSTRACT

Abstract title: *Impact assessment on air quality of a waste-to-energy plant in Turin*

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Abstract text (*maximum 350 words.*)

Waste treatment plants usually rise great concern in the population living in the neighbourhood about their impact on environment and health. For this reason, a Sanitary Surveillance Plan was foreseen to keep a close watch on the possible state of health changes of population living near the Turin waste-to-energy plant: SPOTT (Surveillance on POpulation health around the Turin waste-of-energy plant) project, started in 2013 and involving a group of public institutions working on sanitary and environmental topics.

Modelling simulations, using data from the Continuous Emission Monitoring System (CEMS) and, for micropollutants and metals, from discontinuous measures, will estimate the plant contribution to air quality levels and soil deposition over an area of 45 km x 48 km, including Turin and the neighbouring municipalities. Air concentrations and soil depositions of not reactive pollutants will be assessed with a lagrangian particle model (SPRAY) over three different years, to describe the plant impact during different meteorological and emissive years. Moreover, simulations will be carried out with a Chemical Transport Model (FARM) to assess the plant contribution on primary and secondary pollutant concentrations. Modelling results will give a complete description of the plant impact on air quality and support the epidemiological studies in the SPOTT project.

Results obtained with SPRAY dispersion model over 2019 have been compared to air quality national limit values and concentrations measured at monitoring sites. All the pollutant concentrations produced by the plant, both in air and in depositions, show a rather moderate contribution to measured concentrations, frequently more than one order of magnitude lower to measured values. Only for mercury, annual mean concentrations in soil depositions are comparable to those measured at Beinasco site, confirming the importance of the waste-to-energy process as source of this pollutant. Further search will be carried out with the results of the modelling simulation over year 2016, being characterized by mercury emission levels higher than in 2019.

Year 2019 is being investigated also running the CTM FARM; the results will be compared to and will integrate the information obtained with the SPRAY model.