

Background Odour Assessment in Biogas Projects: Managing Exceedances in Cumulative Impact Analysis

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Following Russia's invasion of Ukraine, the European Union reassessed its dependence on imported natural gas and promoted biogas as a strategic alternative. Despite being the second European country with the highest potential for biogas generation from livestock waste, Spain remained behind in implementation. Consequently, national authorities developed a roadmap to foster biogas production, leading to a rapid increase in planned facilities.

This fast expansion triggered public opposition, primarily due to odor concerns, which slowed the permitting process. In 2025, a company planning a livestock-waste biogas plant requested a pre-operational odor impact study from our team. The assessment included estimating background odor concentrations, as local residents were already affected by emissions from nearby livestock facilities.

A detailed inventory identified 11 livestock operations within a 2-kilometre radius. Using standard emission factors, each source was modelled with an atmospheric dispersion model to calculate background odour levels. Results confirmed existing odour impacts within the municipality before the biogas plant's construction.

To evaluate cumulative effects, the planned facility was added to the model. Following German regulatory criteria, which set a 20% threshold for exceeding background concentrations, results showed the new plant's contribution remained below this limit. These findings demonstrated that the proposed facility was technically and environmentally viable, with manageable odour impacts under established emission and dispersion conditions.

Topic: 8. Dispersion modelling.