California State Agencies Collaborative Research Project

Improved Greenhouse Gases Inventory Method for California Landfills

Agencies involved and their roles:

California Energy Commission, California Public Utilities Commission, CalRecycle, and Air Resources Board.

The California Public Utilities Commission funded this research project via the Energy Commission's Public Interest Energy Research program which provided technical and administrative management support for this project. CalRecycle provided technical advice throughout the project and the Air Resources Board participated as member of the technical advisory committee created for this project.

Funding:

California Public Utilities Commission/California Energy Commission: $399,929

Background information:

Solid waste landfills are deemed to be a major source of methane in California and reducing emissions from landfills was identified as part of the implementation of AB 32 to reduce greenhouse emissions in California. However, there are substantial uncertainties with the existing methods used to estimate methane emissions from landfills. Prior measurement studies suggest that the currently available and internationally accepted methods could be in error by a factor of two or more because these methods do not fully account for all the main factors affecting atmospheric emissions such as the oxidation of methane in cover soils.

In 2005 the Public Interest Energy Research program conducted a review of nationally and internationally approved methods used to estimate greenhouse gas emissions. This review identified priority areas of research which included the need to measure methane emissions in California landfills and to develop a new improve model to accurately estimate emissions.

Project description:

This multi-year project involving Landfills +, Inc. and the US Department of Agriculture developed a new methodology called the California Landfill Methane Inventory Model. The model integrates site-specific information with validated US Department of Agriculture meteorological and soil moisture/temperature models, and includes the effect of seasonal methane oxidation on methane emissions from daily, intermediate, and final cover materials. The researchers measured methane emissions at two California landfills for two years and used the data to validate assumptions used in the model. The model was successfully beta tested at several solid waste landfills in California. The development of the model has been received with high interest outside California. For this reason, the model is being tested by groups in other states and countries.

Research coordination:

The research coordination started with the preparation of a request for proposals that culminated with the selection of Landfills +, Inc. Representatives from CalRecycle (formerly the Integrated Waste Management Board) and the Air Resources Board were part of the team that reviewed the proposals and selected Landfills +, Inc. During the execution of the project these two agencies were an integral part of the project. For example, CalRecycle allowed access to their data sets from landfills in California to determine what information was already available and periodically conveyed new information that could be used as input to the new model being developed. Both agencies were key members of an informal technical advisory committee formed to help guide the execution of the project. Public Interest Energy Research program staff held several meetings with the members of the advisory committee during the execution of the project. The last meeting took place in May, 2010 in which the principal researchers presented the final results of this project.

Funding and approval of this research project by the California Public Utilities Commission was essential.

Benefits to the state:

The Air Resources Board maintains the official inventory of greenhouse gas emissions for California and has identified the reduction of methane emission from landfills as one of the measures to be implemented to achieve the emissions reductions required by AB 32. This research project has provided additional information and tools for the Air Resources Board and CalRecycle to use for future updates of the California inventory. Finally, the California Landfill Methane Inventory Model can be used by owners/operators of landfills to test different low-cost options to reduce emissions (e.g., changing the composition of the cover soils to increase the oxidation of methane, reducing atmospheric releases) and lower compliance costs to the benefit of California.