



Estimating short-lived climate pollutants from municipal solid waste in Tyre Caza, Lebanon

Background

Tyre Caza is a coastal district of Lebanon that includes the historic city of Tyre and provides solid waste collection services for 400,000 people. In 2015, Lebanon had a waste management crisis with no waste pickup services after the closure of a large landfill for 8 months. Currently, the national government is operating under a temporary waste management plan since no new plan has officially been adopted. As of 2020, Lebanon has landfills, but the district of Tyre Caza does not. Tyre Caza uses dump sites and open burning as its core waste management strategy. About 80% of waste in the district was disposed in dump sites as of 2018.

The International Solid Waste Association (ISWA) used data from Lebanon's Ministry of Environment and Office of the Minister of State for Administrative Reform (OMSAR) surveys in 2005, 2011-2016, and 2018 to develop inputs for the Solid Waste Emissions Estimation Tool (SWEET). SWEET was developed by the U.S. Environmental Protection Agency under the auspices of the Global Methane Initiative. ISWA used SWEET to estimate short-lived climate pollutants from municipal solid waste in Tyre Caza for business-as-usual and four alternative policy options. The alternative scenarios are based on proposals from OMSAR.



Source: ISWA and Karim Hashash of OMSAR.

Baseline

The ISWA study authors calculated current waste composition from a 2018 OMSAR report and historic waste volumes based on data about a large dumpsite from a 2017 OMSAR proposal on dumpsite closures. The business-as-usual (or baseline) scenario considers the disposal of 100 thousand metric tons of municipal solid waste separated into recycling, composting, burning, and disposing in dump sites. The baseline scenario also assumes the government will construct a landfill in the next decade.

Alternative Scenarios

The four alternative scenarios build upon the baseline with measures such as conversion of uncontrolled dumpsites to controlled dumpsites, covering and closing dumpsites, reducing and eliminating waste burning, and capturing and combusting landfill gas from the new sanitary landfill. The authors added each scenario into SWEET with the start year and percent changes to waste burning.

Modeled Results

In 2050, three of the alternative scenarios would produce less than half of the amount of CO₂e emissions projected for 2050 in the baseline scenario. Comparing the SWEET results, the authors find that the largest emissions reductions come from the combination of closing and remediating dumpsites, ending waste burning, and building a sanitary landfill to receive all waste disposal.

Using the Results

ISWA recommended that Tyre Caza conduct feasibility studies as a next step before choosing a solid waste management program. SWEET was used as a preliminary scoping strategy to focus on specific policy measures that could improve public health and reduce greenhouse gas emissions.



Launched in 2004, the Global Methane Initiative (GMI) is an international public-private initiative that advances cost-effective, near-term methane abatement and recovery and use of methane as a clean energy source.

For more information, see the report [“Estimation of Waste Sector Greenhouse Gas Emissions in Tyre Caza, Lebanon, Using the Solid Waste Emissions Estimation Tool” \(2020\) from the International Solid Waste Association.](#)