**Technical Appendix: GHG Emissions Calculations**

The Calculations for the Paso Robles Regional Renewable Energy Park have been broken down by Sector.

**Landfill: TAB 2**

Used by inputting estimated Landfill Gas Emission data into the provided tool created by the EPA, Emissions Reduction and Environmental and Energy Benefits for Landfill Gas Energy Projects, **Tab 2**,on the provided GHG Emissions spreadsheet.

The Landfill is due for an upgrade to its flare and will install and upgrade the gas collection system, including new headers, and blowers which will increase the amount of gas collected from the site.

Current estimations are at 260 SCFM once this work is complete.

That number was used to calculate the associated GHG Emission Reduction Estimates utilizing the provided EPA Tool.

**Anaerobic Digestor: TAB 3**

<https://www.epa.gov/system/files/documents/2023-12/warm_v16.xls>

The City has estimates of the anticipated various waste streams that are likely to be processed in the Anaerobic Digestor. From those estimates, they were categorized by type/stream and cross-referenced to the associated Emissions reduction, as identified in the WARM tool, provided by the EPA. Calculations are shown in **Tab 3**

**Transit Bus (MTCO2E) Gas Calculation based on Miles Travelled Annually: TAB 4**

<https://afdc.energy.gov/conserve/public_transportation.html>

Information was provided by the Regional Transit Authority Identifying the amount and type of vehicle miles traveled annually, 112,102 miles for Local Service and 396,854 miles for Inter-City Routes.

These miles were then converted using the US Department of Energy’s estimates to fuel economy for transit buses (3.4 miles/gallon) (see link above)

The miles data was converted to discover how many gallons of gasoline was utilized annually, and then that total was input into the EPA’s GHG Equivalency Calculator to determine the total reduction by phase (2025-2030, and 2025-2050) <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

The total gasoline usage conversion is shown in the totals in **Tab 4**

**Transit Emissions Offset Through Energy Production from Converted Landfill Gas (Minus the demand to charge Regional Transit Buses): TAB 5**

California Air Resources Control Board has provided an estimate for Monthly Electricity Demand for a Transit Bus at 10,000kwh. The two generators purchased through this grant would produce 230kwh each or 460kwh total. The estimated uptime for these installations is 95%.

The total annual production was then calculated at (460 kwh produced/hour x (24x.95 for total uptime) x 365days) to determine total Kwh production for the two generators per year. (3,828,120 kwh/ year)

For Phase 1 of the grant (2025-2030) the City estimates all 13 vehicles could be converted to Electric power. (13 vehicles x monthly demand (10,000kwh) x 12 months in a year). This number is then subtracted from the total annual production (3,828,120kwh) and then multiplied by 5 for a total of 11,340,600 kwh that were not used for energy production for Transit Buses.

This remaining power was then converted using the same EPA GHG Emission Conversion Tool to generate associated MTCO2E.  
  
This same process was mirrored in the calculations of the entire length of the project, where the remaining annual total unused electricity was multiplied by the number of years (25). However, at this stage the City estimates that the RTA would have purchased an additional 7 vehicles (to make 20 total vehicles that would need to be charged). These reductions were also included in the calculations, based on the inclusion of the additional vehicles in 2035.

<https://ww2.arb.ca.gov/sites/default/files/2022-06/ratesanddemand_ADA.pdf>

This is all calculated in **Tab 5**

**Solar Energy Production Estimated to Offset GHG Emissions: TAB 6**

Estimated utilizing the numbers provided in the US Energy Information Administration report (<https://www.eia.gov/tools/faqs/faq.php?id=104&t=3>) which when converted estimates that 1MW Solar array could produce 8760MWh /year if it ran for 24hrs.

A search determined that the average Peak Sun Hours for (Los Angeles, similar to our location) is equal to around 6 hours a day

<https://www.turbinegenerator.org/solar/california/los-angeles/>

This number was then utilized as a base to establish what energy production could more realistically look like from a solar array at our site.

Annual 8760MWh/4 (only 6 peak hours can be utilized) = 2190MWh per 1MW Solar.

The proposed installation by the City would be for a 5MW solar installation, which when converted equals 10,950,000 kwh annually.

This number was then utilized to calculate GHG Emission Reduction totals for the two separate reported year categories (2025-2030 and 2025-2050).