

Greenhouse Gas Inventory Results

Presented to

Board of Directors
Truckee Tahoe Airport District

October 25, 2017

Presented by:

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TTAD's Objectives for the GHG Inventory

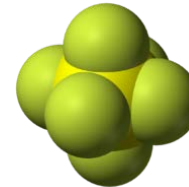
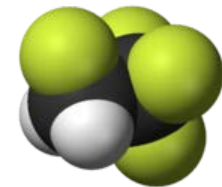
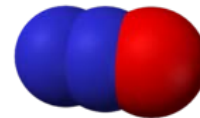
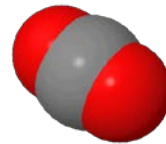
1. Demonstrate environmental leadership.
 2. Prepare the District for future legislation at the Federal, State, and local level related to GHG and carbon emissions.
 3. Look for fuel consumption related efficiencies
 4. Look for ways to mitigate direct and indirect GHG by the Airport.
 5. Use data to identify current and future trends and compare against other airport inventories to benchmark progress.
 6. Assist Board and Staff in airport policy and decision making.
 7. Complete the first critical step in preparation of an Environmental Sustainability Plan and Environmental Management System.
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Deliverables

- 2015 Greenhouse Gas Inventory Report
 - Identifies the inventory scope, presents emissions for 2015, identifies 2015 data sources, and references emissions quantification methodologies.
 - Greenhouse Gas Inventory Management Plan
 - Defines inventory boundaries, identifies data collection methods, and details emission quantification methodologies and assumptions
 - GHG Emissions Calculations Spreadsheets
 - Presents the calculations for the 2015 inventory
 - Provides a calculation tool for future inventories
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Inventory of Greenhouse Gases

- Inventory quantified emissions of:
 - Carbon Dioxide
 - Methane
 - Nitrous Oxide
 - Hydrofluorocarbons
 - Perfluorocarbons*
 - Sulfur Hexafluoride*



Total GHG Emissions: Scope 1

- Scope 1: direct GHG emissions from activities that are owned or controlled by TTAD including
 - stationary combustion,
 - mobile combustion,
 - fugitive emissions.
- TTAD Scope 1 sources include:
 - Natural gas for heating
 - Diesel fuel in vehicles
 - Refrigerant leaks from AC units
- 158.60 metric tons carbon dioxide equivalents (CO₂e)
- approximately equivalent to the GHG emissions produced by 33.5 passenger vehicles driven for a year

Total GHG Emissions: Scope 2

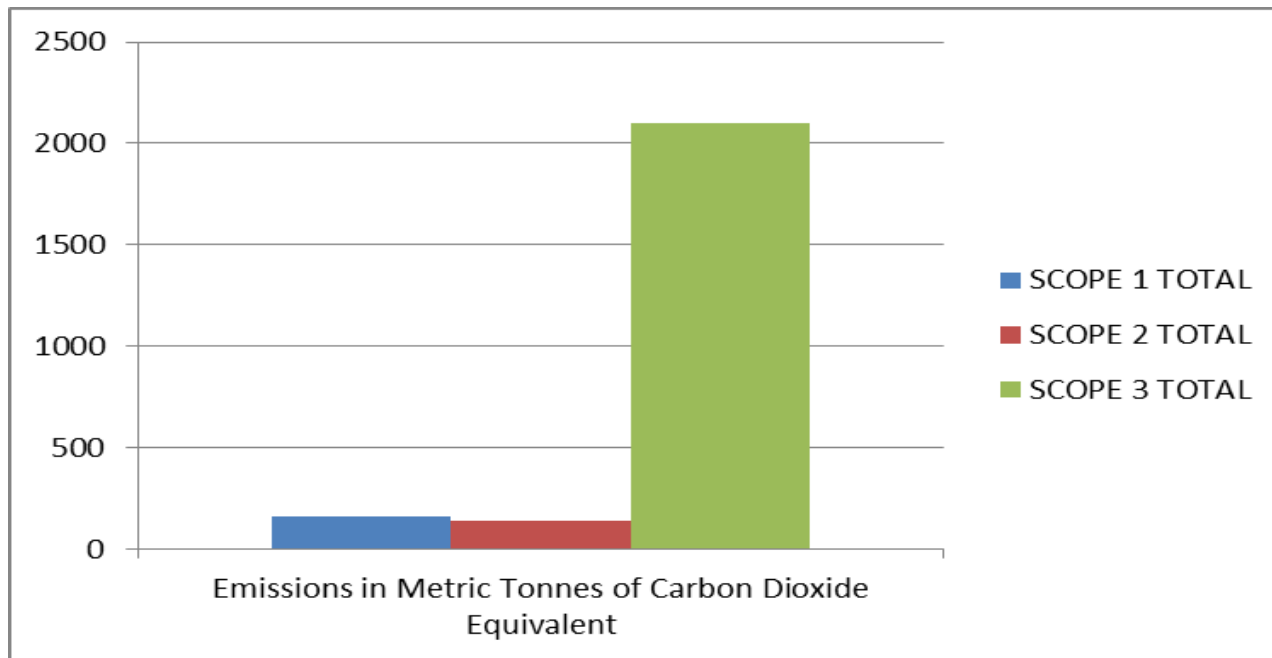
- Scope 2: Indirect GHG emissions from the generation of purchased or acquired energy, such as electricity, which is consumed by TTAD.
- TTAD Scope 2 sources are limited to purchased electricity
- 138.07 metric tons CO₂e
- equivalent to the CO₂ produced from electricity use by 20.4 homes for one year

Total GHG Emissions: Scope 3

- Scope 3: All other indirect emissions not covered in Scope 2, including
 - tenant activities: stationary combustion, mobile combustion, electricity consumption, etc;
 - methane emissions resulting from airport waste disposed in third-party landfills;
 - aircraft operations: specifically from the LTO cycle to an altitude of 3,000 feet
- 2099.22 metric tons CO₂e
- equivalent to the CO₂ produced from 4,860 barrels of oil consumed

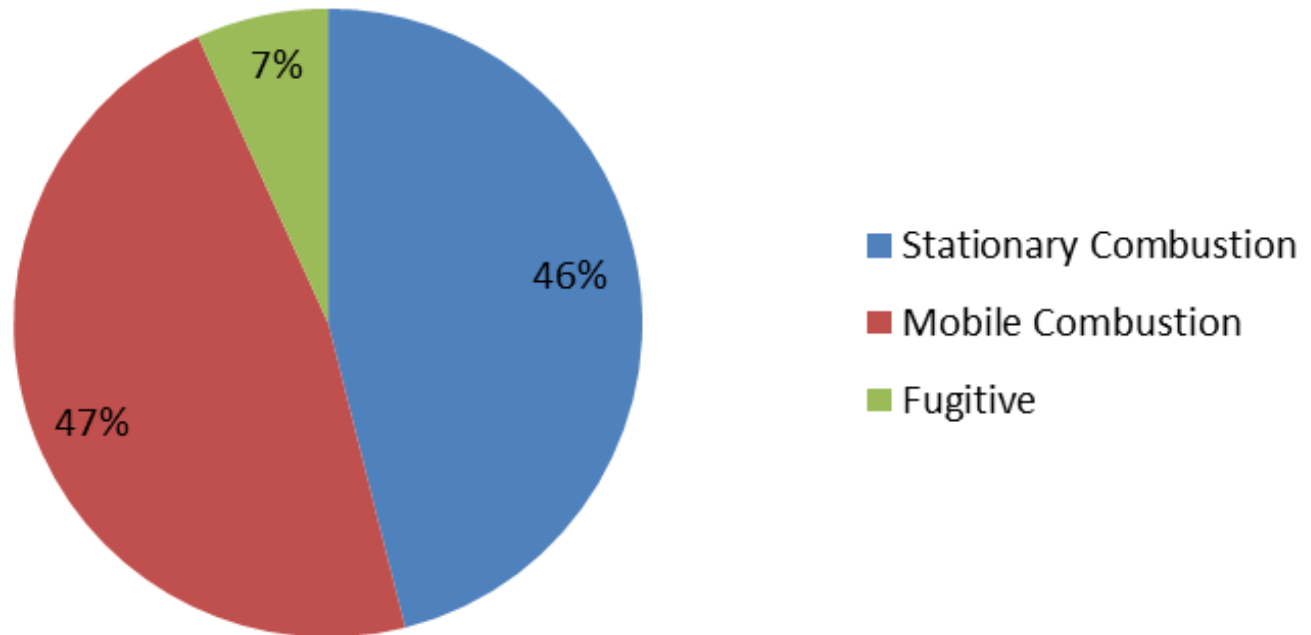
Big Picture: Total GHG Emissions by Scope

- Scope 1 GHG emissions - 158.60 metric tons carbon dioxide equivalents (CO₂e).
- Scope 2 GHG emissions - 138.07 metric tons CO₂e
- Scope 3 GHG emissions - 2099.22 metric tons CO₂e.

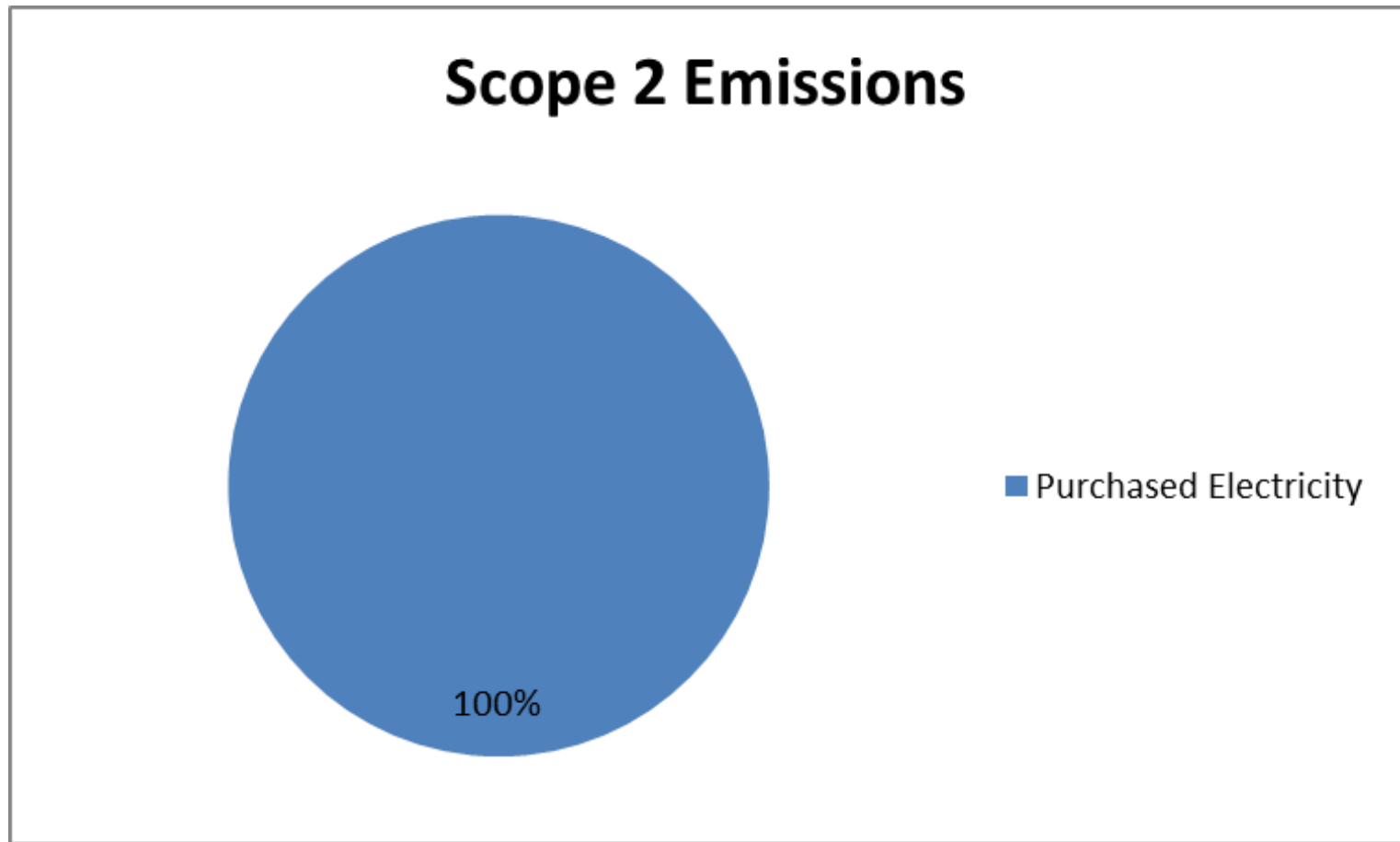


Scope 1 Emissions by Source Type

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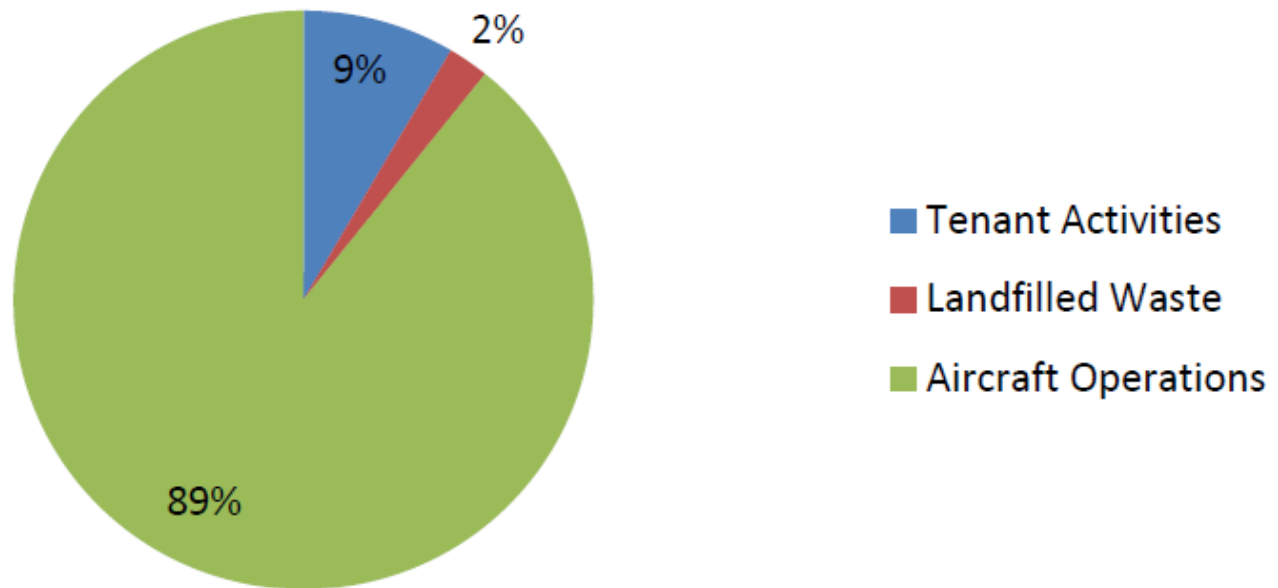


Scope 2 Emissions



Scope 3 Emissions by Category

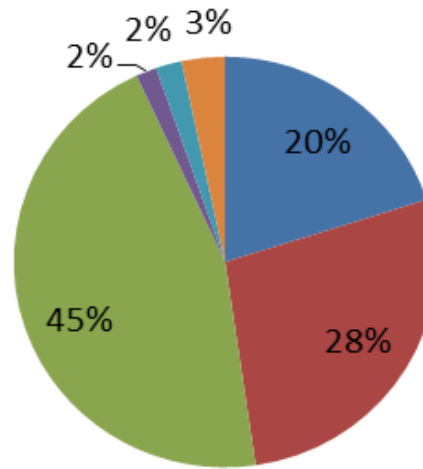
Scope 3 Emissions by Category



Scope 3 Emissions from Aircraft Operations

Aircraft Operations Emissions by Source Type

■ LTO - Pistons ■ LTO - Turboprop ■ LTO - Jets
■ Engine Startup ■ APU ■ LTO - Helicopter



Aircraft operations	
Aircraft operation category	MT CO ₂ e
LTO Cycle – Piston Aircraft	376.30
LTO Cycle - Turbo Prop Aircraft	517.07
LTO Cycle – Jet Aircraft	850.85
LTO Cycle - Helicopters	62.04
Engine Startup	29.92
APU Operations	37.07

TTAD Objectives and Results

Inventory objective	Inventory project deliverable
1. Demonstrate environmental leadership.	Inventory report
2. Prepare the District for future legislation at the Federal, State, and local level related to GHG and carbon emissions.	Inventory report
3. Look for fuel consumption related efficiencies	Inventory report, calculation tool, inventory management plan
4. Look for ways to mitigate direct and indirect GHG by the Airport.	Inventory report, preliminary reduction list
5. Use data to identify current and future trends and compare against other airport inventories to benchmark progress.	Calculation tool, Inventory management plan
6. Assist Board and Staff in airport policy and decision making.	Inventory report
7. Complete the first critical step in preparation of an Environmental Sustainability Plan and Environmental Management System.	Inventory management plan

Post-inventory airport advantages

- Prepares airport to monitor GHG emissions in the future.
- Increases awareness of the climate impacts of airport activities and aircraft operations.
- Provides starting point and reference for emission reduction efforts through the development of airport policies, programs and projects.

Potential reduction efforts

Dozens of potential ways to reduce airport's GHG emissions including but not limited to:

- Vehicle technology upgrades to hybrids or electric vehicles
- Vehicle fuel switches to biofuel blends
- Building lighting and insulation upgrades
- Aircraft taxi and APU policy development
- GHG offsets, RECs and renewable fuel attributes
- Forestry sequestration

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Preliminary List of Potential GHG Reduction Actions for Truckee Tahoe Airport District

Reduction Area

Scope	Emission Category	Reduction Action
Direct Actions in the Inventory Boundary		
Scope	Emission Category	Reduction Action
Scope 1	Stationary combustion	Energy Audits Insulation improvements Thermostat upgrades Fuel switch - gasoline - E10/E15 Fuel switch - diesel - B5/B20 Fuel switch - biogas/LFG direct access Fuel switch - RNG transfer by displacement Cogeneration system Central heating Geothermal heating
	Mobile Combustion	Fuel switch - gasoline - E10/E15 Fuel switch - diesel - B5/B20 Vehicle upgrade - Increased MPG Vehicle upgrade - hybrid technology Vehicle upgrade - electric vehicle Vehicle upgrade/fuel switch - gasoline - E85 Vehicle upgrade/fuel switch - CNG
	Fugitive emissions	Leak detection & reduction program Refrigerant switch - Lower GWP
Scope 2	Electricity	Energy Audits Building lighting efficiency upgrades Runway lighting efficiency upgrades Other energy efficiency measures (e.g. pump upgrades, etc.) Self generation - Solar Self generation - Wind Self generation - Microturbine Green Power PPA
Scope 3	Tenant Activities	Tenant Policy Development Tenant Sub-metering
	Landfilled Waste	Recycling program Composting program LF gas capture
	Aircraft LTO	Taxi policy and procedures Alternative fuels for aircraft Push back/taxi tugs Jet engine washing
	APU Emissions	APU usage policy and procedures GPU services
"Balance Sheet" actions		Offset purchases REC purchases RNG transfer by renewable attributes Sequestration
Actions outside the inventory boundary		Priority parking areas for low carbon vehicles Public transit promotions Alternative fuel rental cars Alternative fuel limo and taxi Construction policy development
Other		Reporting or Accreditation Program Participation