

Estimating Airport Greenhouse Gas (GHG) Emissions

Local political and community interest in environmental impacts, specifically greenhouse gas (GHG) emissions, are a growing concern for municipalities across the country. These concerns have led to the desire to estimate the contribution of local sources to GHG emissions. *ACRP Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (2009) was developed to assist airport operators

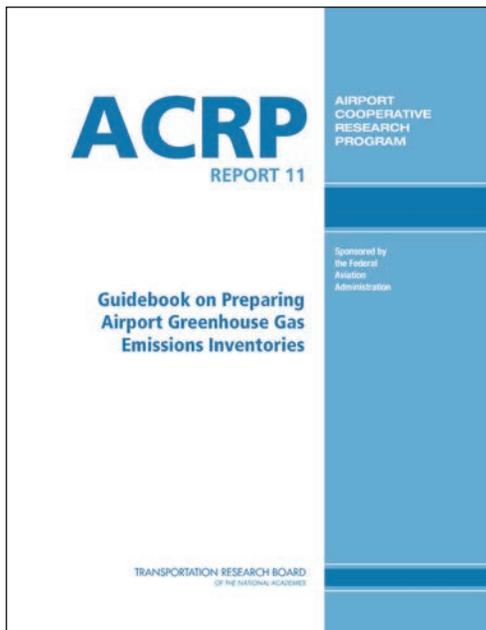
and others with generating airport-specific GHG emission inventories. The guidebook provides a framework for identifying and quantifying specific components of airport contributions to GHG emissions.

Various reasons exist for why a GHG emission inventory should be developed including: 1) climate change initiatives, 2) environmental management and sustainability programs, 3) disclosure of project effects, and 4) future regulations. GHG emissions can be derived from many sources (aircraft, parking facilities and roadways, generators, boilers, heaters, etc.) and activities (parking, maintenance, construction, etc.) at an airport. Ownership or influence of the emissions (airport operator, tenants, public, etc.) are important to consider

as part of an inventory, as well as the geographic components of GHG emissions.

Ultimately, the procedures for developing a GHG emissions inventory rely on data, which may or may not be available at a given airport. To account for numerous data sources and formats, the guidebook provides a preferred approach and alternative quantification approaches for emissions sources. This flexibility allows airports to establish a more complete estimate of emissions even when the preferred methodology cannot be applied.

For instance, when considering the impacts of ground access vehicles at an airport, users are provided three alternatives with varying data requirements, from an average mileage usage applied to an average emissions factor to a vehicle-specific mileage usage combined with vehicle-specific modeled emissions factor. The preferred method is the most complex method with vehicle-specific usage and modeled emissions data, but the guidebook realizes the limitations presented by data availability and recommends that users apply the most complex method possible given the available data. These well-defined methodologies also allow users to determine which data they would like to collect in the future to provide more accurate estimates of GHG emissions, while considering limited budgets for data collection, control over the multiple types of emissions, and the impact of potential mitigation strategies.



Right: Kris Russell in front of boilers at Dallas/Fort Worth International Airport (DFW) that were included as direct emissions sources in the calculation of GHG emissions at the airport.

Photo courtesy of DFW Airport.



Greenhouse Gas—continued

Since 2006, an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators.

Officials at the Dallas/Fort Worth International Airport (DFW) have used the guidebook to develop a GHG emissions inventory for the airport. Kris Russell, Senior Environmental Analyst at DFW, first learned about the ACRP project at an Air Quality Conference in 2008 sponsored by the American Association of Airport Executives (AAAE). Following the conference, Russell developed a GHG emissions inventory for the airport which considered direct emission sources, indirect sources, and some optional sources. Direct emissions are generated by airport operator-owned vehicles and facilities. Indirect emissions are emissions from plants that generate power purchased by an airport. Optional emissions can include tenant activities (such as aircraft emissions), public ground transportation, and employee commuting.

Russell noted, “The guidebook was useful for applying the concepts and details necessary for developing spreadsheets to calculate the emissions at our airport.” He added, “Additionally, the flexibility available through the alternative estimation techniques made the guidebook practical since we could apply the data we had available.” The options presented in the guidebook allow users to select an acceptable method based on available resources and information.

ACRP Report 11 provides a consistent methodology that can allow for comparisons between airports and help airport owners communicate the current GHG emissions status and the impacts of potential mitigation techniques to local communities and other stakeholders. Users of the inventory procedures can track GHG emissions over time or examine the

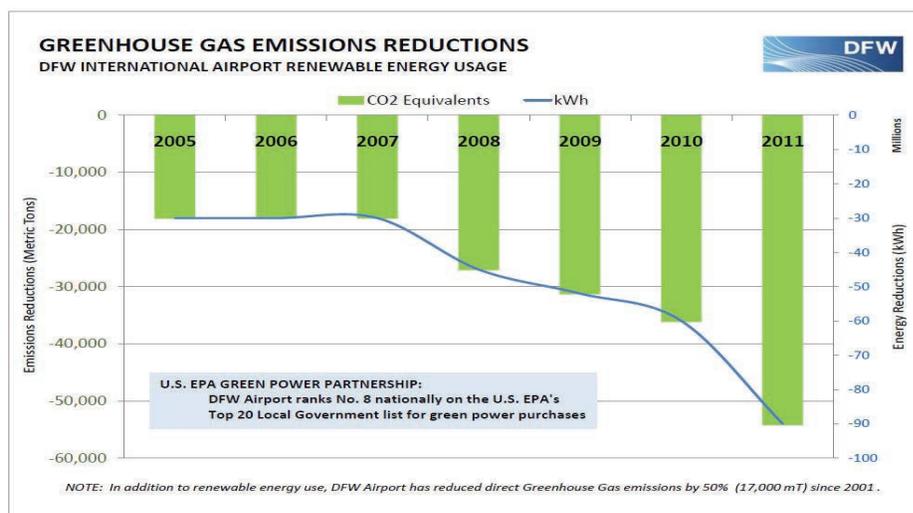
likely effects of operations which might impact GHG emissions.

For DFW, Russell also applied the methodology from *ACRP Report 11* to estimate the emissions reductions from acquiring renewable wind energy sources in their electricity contract; these renewable sources have grown to 30% of the facility’s electricity usage since 2005. Reductions can be easily graphed to quickly convey the return on the investment in a technology or alternative energy source over time. This quantification of benefits helps airport management and boards make wise investment decisions and supports collaboration with other entities, such as state or regional transportation agencies, that are working to reduce GHG emissions.

At DFW, staff conducted the emissions inventory and analysis, without the need for outside assistance. However, if in-house resources are not available, *ACRP Report 11* offers valuable information for developing proposal requests for hiring consultants to perform the work, ensuring a consistent methodology is applied.

“Given the level of interest regarding aviation’s contribution to GHG emissions and ultimately to climate change, it is important that airports have information necessary to address potential concerns. This guidebook provides a concise set of step-by-step instructions on how to generate airport GHG inventories.”

ACRP Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories



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