



“KILL-A-WATT”

JULY NEWSLETTER

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JBSA ENERGY PROGRAM



Attainment Through Energy Efficiency

ATTAINMENT, ITS IMPACTS, AND HOW IT RELATES TO ENERGY

Many people have been hearing that a new jet will be used for training at JBSA, but the jet produces more NO_x, and we would fail to meet attainment standards if the jets operated at the desired frequency to produce pilot classes. Saving energy has been looked at as a solution to the increased NO_x levels, but many may not realize the degree to which facility energy use affects these emissions levels.

[What is an Attainment/Nonattainment Area?](#)

The Clean Air Act is a federal law that is used to regulate air pollution on a national level. There are three designations for the attainment status: attainment, nonattainment, and unclassified. An attainment area is an area which is in compliance with National Ambient Air Quality Standards (NAAQS). A nonattainment area is one which does not meet the air quality standards. An unclassified area is an area which did not have enough data to be classified as either attainment or nonattainment. There are many different pollutants that are taken into account when deciding attainment status such as NO_x, CO₂, and particulate matter. Any area can achieve attainment for one pollutant, but be in nonattainment for another pollutant.

In 2018, Bexar County's air quality was designated as "marginal nonattainment" in regards to the region's ozone levels, which means that the county fell just short of the air quality standards (i.). We still remain in marginal nonattainment and are taking measures to reach attainment.

[What are the Impacts of Nonattainment?](#)

As mentioned above, San Antonio is in marginal nonattainment status for ozone. Ozone formation is limited by the amount of NO_x produced from human activities; the more NO_x that is produced, the higher the ozone level. The nonattainment status has resulted in county wide restrictions on idling vehicles, and JBSA has followed suit to aid in the pursuit of achieving attainment status. Vehicles are not the only contributor to nonattainment though, which is why there has been an increased interest conserving energy through renewable sources and more efficient equipment, but how much impact will facility energy reduction have on attainment status?

[How is Attainment Related to Energy?](#)

The traditional way to produce energy is combustion which mixes a fuel with air in order to produce energy. When mixing fuel with air (21% Oxygen and 78% Nitrogen), there are many products that can result from the incomplete combustion process including SO_x, NO_x, and CO_x. In order to reduce greenhouse gas emissions, companies install the most efficient equipment they can afford and implement renewable energy when feasible. Backup generators and boilers are common pieces of equipment that facilities utilize which impact NO_x emissions most. Generators are meant to produce electricity, so they have to burn a fuel source (typically diesel or natural gas) in order to keep a facility



running when necessary. Large boilers typical burn natural gas in order to keep water warm for the heating coils in a building.

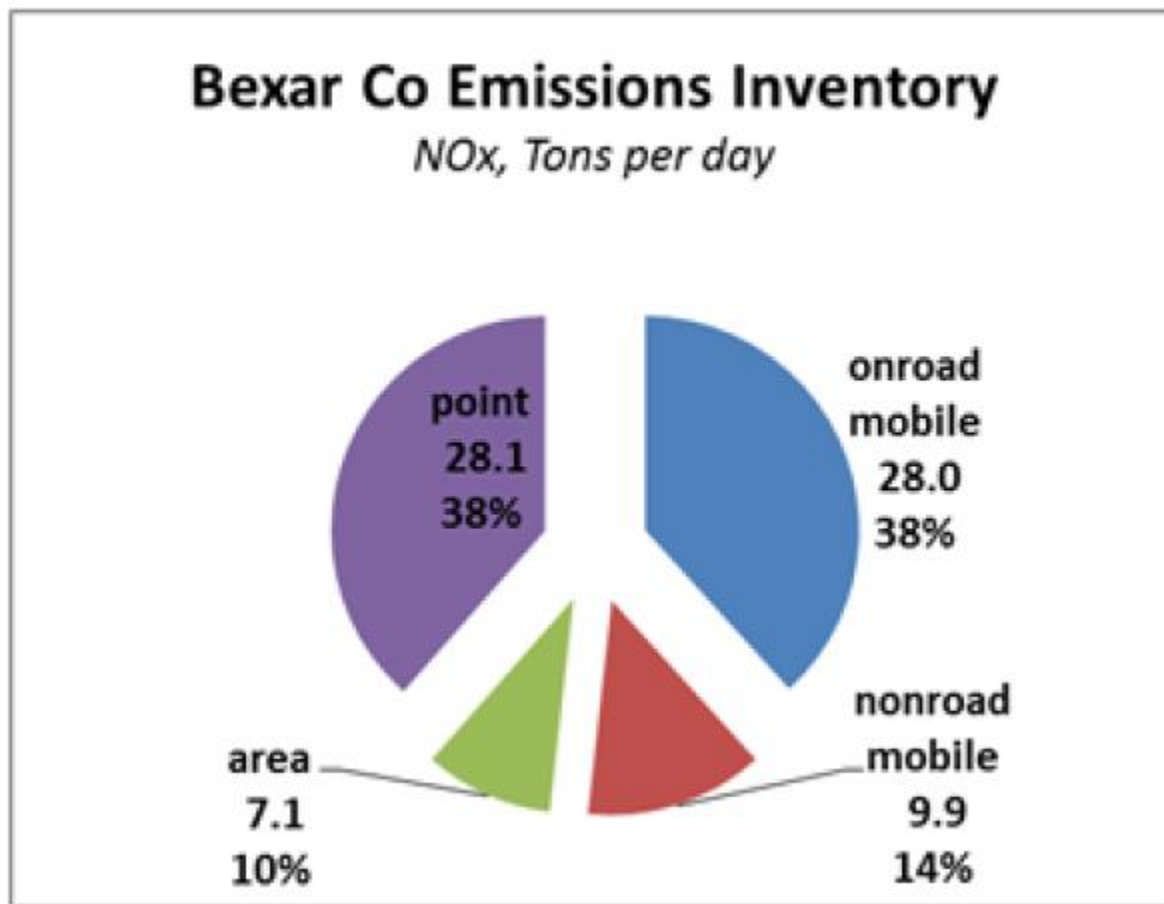


FIGURE 1 NO_x EMISSION COMPONENTS

Reducing energy consumption at commercial buildings does reduce NO_x emissions slightly, but attempting to reduce NO_x emissions to an acceptable level through facility energy reduction is not feasible as the main NO_x contributor is transportation. While electric plants produce about 20% (Electricity production makes up 60% of point sources which are large stationary emissions sources such as electricity services, electricity generation, and cement plants) of all NO_x emissions, the transportation industry is responsible for about 50% of NO_x emissions (ii.). The reason transportation creates so much NO_x is because internal combustion engines (typically < 30% efficiency) are much less efficient than energy production plants (~ 58% efficiency) and boilers used by commercial buildings (> 80% efficiency).

At JBSA, there are plans to replace some training aircraft with new aircraft which produce more NO_x. When this increase in NO_x was brought to the bases attention, we learned that the energy savings performance contract (ESPC) will have an impact on NO_x production, but the impact will not be enough to offset the increase in NO_x production. The ESPC will only able to make up for about 50% of the

anticipated increase resulting from the implementation of the new aircraft. Even though 82,241,175 kWh are being saved annually which saves \$8,798,491 per year, the emissions levels produced by the new aircraft still exceed our threshold for meeting attainment standards.

- i. Alvarez, Ashley and Schliesinger, Carol. "EPA designates Bexar County Air Quality in Nonattainment". *Communication and Public Affairs*. July 18, 2018
- ii. Sonja Sax, Bonyoung Koo, Ross Beardsley and Sue Kemball-Cook. "How Ozone Pollution Affects Public Health in San Antonio: An Analysis Commissioned by the City of San Antonio". Ramboll Environ. September 2017.