Cost-effective Diesel Engine Emission reductions from Trucking in Laredo, Texas

U.S. – Mexico Border Program

Photo by Gerrit Cellar in Pixel

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The Laredo Port of Entry (POE) is the top ranked port of entry in trade in Texas, second in the United States, just behind the Port of Los Angeles. In 2018, over $740 Billion in trade was produced in Texas, with Laredo POE accounting for approximately 33% of this total. In 2018, over 2.3 million trucks crossed northbound, approximately 14,000 per day. Depending on the activity, trip of the truck, total idling, commercial trucks can be a significant source of Particulate Emissions (PM) in the environment, as well as, public health, particularly children.

The Rio Grande International Study Center (RGISC) received a Border 2020 grant to reduce emissions from diesel engine idling in Laredo, Texas. The project, the Clean Truck Initiative, focused on outreach to owner-operator truck drivers who may not have the capacity to research and learn about new technologies that reduce emissions. The second audience for this project was forwarding and logistics warehouses, especially those that hold refrigerated freight and may run their engines for long periods of time and located near schools and residential areas.

With the start of the Clean Truck Initiative, RGISC partnered with IdleAir and several truck stops in the Laredo area, to help educate and provide educational resources to Laredo's commercial truck drivers on idling and its impact to the environment and public health, as well as, information on cost-effective reduction technologies that can be used. RGISC distributed over 1,500 educational brochures (English brochure; Spanish Brochure) at seven truck stops, two of which are equipped with IdleAir's technology. IdleAir Technology gives commercial truckers an opportunity to save money (approximately $4,000 - $7,000 annually) by not having to run their diesel engines by providing an electric parking space which provides idle-free HVAC, Wi-Fi and electricity for in-cab appliances. By giving drivers the opportunity to shut off their engines, drivers are not having to deal with truck noise, vibration and exhaust fumes from idling. During the project period, IdleAir also provided discount vouchers to drivers to be used at its two locations in Laredo, Texas.

RGISC produced four public service announcements (English - Public Service Announcement 1; English - Public Service Announcement 2; Spanish - Public Service Announcement 3; Spanish - Public Service Announcement 4) circulated through RGISC's social media sites and area news stations. The project was report through two local news medica: 1) October 19, 2020, the Laredo Morning Times Business Journal Vol.2 No.33 and 2) On November 5, 2020, the Border Report did a story about the Clean Truck Initiative.

A second product was a "Money-Wise Trucking Guide" in both English and Spanish, where commercial drivers and industries could find information on various idle-reduction technology that is currently available and economic savings and emission reductions from utilizing these technology (Table 1 and Table 2).

From Table 2, if 25% of the heavy duty diesel truck fleet adopted to use either Battery Auxiliary Power Units, Solar No-Idle HVAC or even an electrified parking space, such as the two IdleAir stations locally, over 51,458 tons per year of carbon dioxide reduction could be achieved.

Last, the guide addressed the environmental and public health impacts of diesel emissions. Due to the nature of sources located within the rural parts of Webb County, oil and gas production, for example, is the predominant industry accounting for the majority (72%) of Nitrogen Dioxides (NO2), however, on-road heavy duty diesel vehicles account for 6% of county-wide NOx emissions. With regards to particulate matter, 4% of PM2.5 and 5% of PM10 emissions comes from on-road heavy duty vehicles, again most PM emission sources are in rural Webb County.

The final phase of this border project concluded in December, with outreach to stakeholders to share information compiled in the Money-Wise Trucking Guide and begin promotion of EPA's SmartWay program. RGISC met with the Kiwanis and Rotary Clubs as part of the final project phase. Although, the border funding for this effort concluded in December 2020, RGISC decided to continue to work on this effort in 2021. RGISC is set to meet with additional stakeholders beginning in January including Laredo Motor Carriers Association (LMCA); Association of Logistics and Forwarding Agents (ALFA); Laredo Licensed U.S. Customs Brokers Association; and Laredo Chamber of Commerce board of directors and executive committee; and Mexican Customs in Nuevo Laredo.

Table 1. Annual emissions savings per vehicle per year, tons per year. *(Source: Money-wise Trucking Guide, Table 9)*

Technology	CO_2	NO_x	$PM_{2.5}$	PM_{10}	CO	Aggregate emissions saved
Automatic engine start/stop system	10.1	0.04	0.001	0.001	0.03	10.2
Battery APU	14.7	0.06	0.002	0.002	0.05	14.8
Diesel APU	8.3	0.04	0.001	0.001	0.03	8.3
Diesel-fired Heater	4.5	0.02	0.001	0.001	0.01	4.6
Electrified Parking Space	14.7	0.06	0.002	0.002	0.05	14.8
Heat Recovery	4.9	0.02	0.001	0.001	0.02	4.9
Solar No Idle HVAC	14.7	0.06	0.002	0.002	0.05	14.8
Solar TRU	24.5	0.11	0.003	0.003	0.08	24.7
Storage Cooling	8.0	0.03	0.001	0.001	0.03	8.0

Table 2. Approximate estimated annual avoided air pollution (tons/year) if 25% of trucks crossing the Laredo Port of Entry adopted Idling Reduction (IR) or Electrified Parking Space (EPS) technology. *(Source: Source: Money-wise Trucking Guide, Table 10)*

Technology	CO_2	NO_x	$PM_{2.5}$	PM_{10}	CO	Aggregate emissions saved
Automatic engine start/stop system	35,378	155	5	5	115	35,657
Battery APU	51,458	225	7	7	167	51,865
Diesel APU	28,945	127	4	4	94	29,174
Diesel-fired Heater	15,866	69	2	2	52	15,992
Electrified Parking Space	51,458	225	7	7	167	51,865
Heat Recovery	17,153	75	2	2	56	17,288
Solar No Idle HVAC	51,458	225	7	7	167	51,865
Solar TRU	85,764	375	11	12	279	86,442
Storage Cooling	27,873	122	4	4	91	28,094