Sustainable Freight Pilot Project Ideas Program

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Project Title

Demonstration of Near Zero Emissions Locomotive Technology versus Unregulated

Location of Project

Victorville, California

Executive Summary

CEMEX Construction Materials Pacific, LLC (a part of the CEMEX group of companies) is a global building materials company that develops advanced application solutions in cement, ready-mix, and aggregates in more than 50 countries around the globe. After undergoing an expansion in 2002, the CEMEX Pacific's Victorville plant became one of the largest cement production facilities in the United States. To complement its high production capacity in southern California, CEMEX Pacific has enhanced environmental awareness and sustainability throughout the community by installing four wind turbines. These wind power generators deliver 6.2 megawatts of electrical output to power the Victorville plant. CEMEX Pacific is now looking to expand their environmental sustainability practices by hosting a pilot project demonstration for two line-haul locomotives operating at near zero emissions levels.

Detailed Description of Pilot Project

The proposed industrial project would be located at the CEMEX Pacific Cement Plant in Victorville, CA. There is a 14 mile track connecting the plant to the mine with associated 3.50% to 3.75% gradients. Currently two unregulated pre-1973 3250 bhp EMD SD40 locomotives operate on a 24/7 schedule. There are plans to add 1 incremental pre-1973 SD40 locomotive for new business aggregate operations in 2016. Under current clinker operations and with the new aggregate business expansion, over 270,000 gallons of diesel fuel are / will be consumed by the unregulated locomotives each year. Due to the aging of the locomotive fleet, fuel optimization and efficiencies continue to deteriorate, driving increased unregulated emissions. As confirmed by the Air Resources Board in Sacramento, the activity of these two locomotives is the single largest contributor of NOx and PM emissions in the Mojave Desert Air Quality Management District.

The project would consist of replacing the two EMD SD40 locomotives currently in-use at CEMEX Pacific with two 3218 bhp Tier 4 KLW SE32C DE locomotives. The implementation of the new locomotives will substantially improve rail power availability and performance. This equipment will eliminate the need / addition of a third non-regulated locomotive through substantially reduced mechanical and electrical maintenance requirements and corresponding unit downtime. The KLW SE32C DE locomotives will achieve dramatic reductions in current unregulated emissions and significantly lower emissions in all criteria air contaminants compared to current EPA Tier 4 locomotive standards (see Exhibit 1).

Effective reductions include:

	Total Tons	% Change	NOx Tons	% Change	PM Tons	% Change
(3) SD40-2	84.72	-------	70.83	-------	1.50	-------
(2) Tier 4	10.36	87.77	4.54	93.59	.10	93.33
(2) SE32C DE	2.26	97.33	1.74	97.54	.06	96.00

Overall emissions will also be favorably impacted through an estimated 46%+ reduction in fuel consumption for the clinker operations and the new aggregate business. The KLW SE32C DE locomotives will generate approximately 128,000 gallons of fuel savings through the displacement of the two existing EMD SD40-2 locomotives and through the elimination of the need for a third unregulated unit (reference Exhibit 2).

Consistent with the goals of the Sustainable Freight Action Plan and the objectives of the Sustainable Freight Pilot Project Ideas Program, this project will demonstrate the use of near zero locomotive emissions technologies in a disadvantaged community. More critically, it will provide the necessary first steps in transitioning to near zero emissions for locomotives and the subsequent commercialization of the technology for other rail applications in the state of California.

Estimated Implementation Costs

Near Zero Emissions Locomotives (2)	$6,078,000
Transport of Locomotives to the Project Site	54,000
EPA Approved Field Certified Emissions Testing	124,000
Total Project Cost	$6,256,000
Mojave Desert Air Quality Management District*	$1,000,000
CEMEX Pacific Funding Commitment	350,000
Knoxville Locomotive Works Funding Commitment	50,000
Total Proposed Funding Commitments	$1,400,000

* Requires approval from the Air Resources Board to include Carl Moyer matching project funds for FY 2016 & FY2017 with the proposed Sustainable Freight Pilot Project Ideas Program.

Timeline

Date of Notification to Proceed: 15 months for locomotive delivery and on-site commissioning
3 months for field certified emissions testing
Project Completion Schedule: 18 months total

Progress Measurement & Milestones

The project will be managed through the manufacturer's Gantt charts and the control of milestone schedules versus actual completion dates for the locomotive mechanical and electrical sub-assemblies and assemblies. Certified field testing of the locomotives' comparative emissions (unregulated versus near zero) will be scheduled within 30 days of the locomotive delivery and commissioning dates. The CARB approved certified tester will be required to submit a finalized report within 30 days of the comparative testing in the field of the unregulated and near zero emissions locomotives.

Interagency Partner Roles

The primary roles of CEMEX Pacific and the MDAQMD will be to process contract documentation expeditiously to ensure that timeline schedules are not delayed due to paperwork constraints and authorizations to proceed. The secondary roles of CEMEX Pacific and the MDAQMD will be the coordination of bi-monthly conference calls with Knoxville Locomotive Works to obtain status updates on the manufacturing production schedule. The primary role of Knoxville Locomotive Works will be managing and advancing the production schedule to ensure timetables are met. The secondary role of the locomotive manufacturer will be to coordinate the logistics for locomotive delivery, on-site commissioning and emissions testing and reporting.