

West Coast Diesel Emissions Reductions Collaborative
July 28, 2004—San Francisco, CA
Locomotive and Rail Sector Workgroup Meeting

Facilitator:

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Attendees:

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I. Formal Welcome (Matt Haber)

EPA Region 9 Deputy Air Division Director Matt Haber welcomed everyone to the meeting and thanked everyone for his or her participation.

Mr. Haber reminded everyone that the best way to achieve our goal is to:

- 1) Build the Collaborative by getting the word out on these issues and this effort and providing forums for new ideas and input (our public workshop on June 15th in San Francisco and this meeting/call)
- 2) Implement near-term successes by working together to announce 1 or more regional projects using existing federal grants and small amounts (under \$1 million) of discretionary EPA funds as soon as possible, and
- 3) Create numerous technical papers describing the scope, costs and benefits of large-scale/long-term, regional projects that the Collaborative will implement if adequate funding becomes available.

He also outlined that today's call would focus on:

- 1) Seeing if this Sector Workgroup has any near-term projects for a) either an early September announcement, or b) that should be bumped to the front of the line for possible FY05 funding, and
- 2) Seeing which longer-term projects (meaning, projects that would need more than \$250k of funding) this Sector Workgroup would like to focus on and identify who in the group is most interesting in developing these projects.

1. Possible Projects

1. Idle Reduction/Reducing Unnecessary Idling

Recap from June 15th:

- Prioritize switchers for installing automated anti-idling devices
- Proven technologies available; applicable to switchers and short-liners
- Switcher yards are located at proximity to communities
- Measurable results
- Can leverage funding from railroads (e.g. cost sharing); consider loan program; underwrite capital investment
- Cost: \$14,000-18,000/unit
- Cost benefit: \$2,000/ton NO_x; free for PM

Mike Clift, BNSF

The BNSF Houston Project (funded through TERP, Texas Emissions Reductions Project) is achieving on the order of 20-25,000 gallons reduced fuel consumption/year (4-5,000 gallons/hour use, 90% of time spend idling).

Through an EPA grant, BNSF is also doing a project in Vancouver, Washington.

Not all that excited about a revolving loan concept, would prefer grants.

Lanny Schmid, UP

Using auto start/stop is expected to reduce hours idling in Roseville, California by about 1500-2500 hours/year, with approximately 8000 gallons/year in fuel savings. UP is currently planning a similar project in San Joaquin Valley with a 50/50 split with EPA and the RRs (UP and BNSF) to retrofit 10 switchers with auto start/stop.

Both Class I Railroads will each be retrofitting approximately 70 to 100 switchers in the next year, but are limited because internal competition for available capital investment funds. Both are also buying all of their new locomotives with the technology already built in.

The railroads are not all that excited about a revolving loan concept, and would prefer grants.

Diane Bailey, Natural Resource Defense Council

Would prefer that the government does not give grant money to projects that have relatively short pay back periods.

Paul Bubbosh, US EPA OTAQ/Smartway (www.epa.gov/smartway)

A combination of technologies will create additional reductions. It might also be good to begin to quantify what types and numbers of locomotives exist in the west in order to focus on the most cost effective/greatest impact reductions.

Brian Jennison, Lane Regional

In Oregon, the state provides a 35% tax credit to assist in the prevention and control of pollution from diesel engines.

Oregon Clean Diesel Retrofit Tax Credit

http://www.deq.state.or.us/air/aq/factsheets/cleandieselretrofit_taxcredit.pdf

Oregon Truck Engine Tax Credit

<http://www.deq.state.or.us/msd/taxcredits/factsheets/TruckEngineTaxCreditFactSheet.pdf>

The contact at the Oregon Energy Office is: Dennis Knight, 503-373-1032,
dennis.c.knight@state.or.us.

2. Retrofit head-end power units

Recap from June 15th:

- About 70 locomotives in California
- Amtrak: Joint Power Board is a potential funding source
- Caltrain greens the fleet
- Use CARB verified technologies
- Emission reduction: 85% PM, 35% NO_x, 95% VOC, 90% CO
- Cost/engine: 500 HP \$20,000; 1000 HP \$40,000
- Cost effectiveness: \$5,000 to 7,000/ton NO_x; \$50,000 to 80,000/ton PM

Timothy Taylor, Cleaire Technologies

Head end power is for heating/vent/power strips/lighting. Testing indicates that about 40% of all emissions are from head end power and that these units spend 5000 hours/year in operation.

Claire estimates that there is the potential for NOx reductions to be about 4 tons/year/unit and cost effectiveness would begin at \$4k/ton and go down as technology is commercialized.

Claire submitted the following details on a potential California project after the conference call for consideration by participants. EPA staff has not verified any of the data provided below.

Possible Project: Capitol Corridor (or Caltrain or ACE or MetroLink or San Joaquins)

- Head End Power (HEP) generator providing HVAC, lighting & power to the rail passenger cars
- Propose retrofitting 2 HEP units
- Capitol Corridor provides 12 round trips daily from the Bay Area to the SFNA
- 5,000 hours per year per generator
- Project cost \$150,000 first units

Pollutant	Annual Emission Reductions (tpy)	5-year Cost-effectiveness (\$/t)
PM	0.28	\$117,383
NOx	8.06	\$4,066
VOC	0.28	\$118,054
CO	5.48	\$5,988
PM+NOx+VOC	8.72	\$3,803

3. Retrofit non-road equipment at switch yards

Recap from June 15th:

- Cost: \$40,000 per 1000 HP engine; \$20,000 per 500 HP engine
- Emission reductions are similar to retrofitting head-end power units, but cost effectiveness is higher

Diane Bailey, Natural Resource Defense Council

Terminal tractors are similar to yard hostlers used at the Ports (Ports of LA/LB and Oakland have already begun to clean-up these sources at the ports) – possibility to learn from their example. Options include alt fuels (such as propane) or alt diesel fuels (such as emulsified fuel) with controls.

Even with the 15-17% power loss, emulsified fuel is working okay.

Possible funding from CARB for emulsified fuels (\$.25/gallong subsidy)

4. Prioritize and select 5 switcher yards

Recap from June 15th:

- Use all feasible technologies (retrofit, emission, controls, clean fuels, etc.)
- Candidate switch yards: Colton, CA (2), Commerce, CA (3), Roseville (1), Washington State (1), and Albina Yard, Portland, Oregon (1)
- Cost estimate: \$750,000/unit (e.g. Green Goat); \$1 million per yard (about 10 switchers); may consider to start with one or two yards
- Cost effectiveness: \$5,000/ton NOx

Diane Bailey, Natural Resource Defense Council

This is a strategy that targets areas with greatest human exposure, oldest/dirtiest engines. Could be expanded to regional target areas.

Chris Weaver, Railpower

Green Goat (hybrid) technology is connected to reducing emissions from unnecessary idling – possibly even greater reductions than auto start/stop as so much of rail emissions are when the train is not moving. 70 - 90% NOx reduction and up to 95% reduction w/SCR.

5. Sierra Retrofit Program

Recap from June 15th:

- 4 old line-haul locomotives in Sacramento/San Joaquin Valley
- Rebuild old engines
- Install anti-idling controls, SCR, and PM
- Use clean fuel (i.e. biodiesel) which USDA is willing to support
- Can be tested by CARB at UC Davis facility that is being used for testing of other technologies
- Need \$500,000 for the first year and total \$5 million over a period of 5 years
- Cost-benefit: \$5,000/ton NOx over 5 years; 70% reduction in PM; cost will drop by 50% after the first unit.

Mike Hart, Sierra Railroad Co

Develop system and make it road ready - could be expanded to 100 locomotives.

Seeking grant package – per locomotive: \$750,000 for the retrofit and \$250,000 to pay for 50,000 gallons of biodiesel for 5 years

Use of biodiesel in locomotive engines has been very good and NOx levels were lower than projected, possibly neutral or decrease in emissions.

Project will also address infrastructure/transport issues with bio-diesel by transporting the biodiesel in railroad tank cars, storing the fuel in the tank cars at train yards and dispensing the fuel directly from these tank cars into the locomotives, reducing the overall cost by eliminating intermediate handling of the fuel by a distribution/dispensing.

6. Bring ULSD to market sooner than deadlines

Recap from June 15th:

- Proven; not restricted to locomotives
- Enable the usage of after-treatment devices
- Leverage other grants to help paying for the cost differentials (5-10 cents/gal)
- Get fuel trucking logistics ready
- 15-20% PM reduction, no impact on NOx; unknown for other pollutants

Discussion:

ULSD is more expensive and harder to get, although because RRs are served by the pipelines there's a thought that they'll have access only to ULSD as of 2010 or June 2006 in California.

Puget Sounder Transit (commuter train) may be a possible pilot for ULSD.

Environmental benefits from ULSD without add-on controls aren't so significant. This may be a lower priority project.

2. Next Steps

The group decided to focus on gathering more information, possibly in the form of i) a short-, medium- and long-term matrices (**see below**) and then ii) short prospectuses or draft language, in 5 areas before the next Workgroup meeting in August. Please contact the below mentioned lead to volunteer to help out. One suggestion might be for each of these "subgroups" to have a meeting/conference call. Please contact Michelle Roos if you need help setting that meeting up.

Idle Reduction: Brian Jennison (Lane) and Michelle Roos/Peter Murchie and Paul Bubbosh/Kristen Sipes (US EPA)

Retrofit Head-End Power, Retrofit Long Haul Engines, and Retrofit Short Haul Engines: Michael Murphy (BAAQMD), Daniel Reich (USEPA), Peter Greenwald/Mike Bogdanoff (SCAQMD) and Tom Jordan (SJV) will talk about these three

Retrofit Non-road Equipment: TBD

DRAFT Matrices Below...

