

Clean Air Fleets Program

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Program Development

- Started program in 2004 as a voluntary effort as a result of a RAQC/AQCC diesel stakeholder process
- Received 3 grants and SEPS to start efforts
- After limited interest from private fleets, program shifted focus to school buses
- Developed a coalition of 15 school districts to apply for additional EPA and CMAQ funding
- After successful implementation in schools, received another EPA grant to focus on off-road diesel
- Another grant allowed expansion to include public works vehicles
- A final grant allowed expansion to over the road (OTR) trucking fleets

Management & Resources

- RAQC responsibilities include grant writing, program development, purchasing, contractor coordination, outreach, financial and program management and final program evaluation
 - Fleets assist with these processes and install equipment
- Staffing Resources
 - RAQC has ~1 FTE managing program
 - 40 fleets include fleet, accounting and management departments
- Fleet operators, EPA, CDPHE, CDOT and DRCOG are critical partners

Retrofit Technologies

- **Diesel oxidation catalysts (DOC - \$900-\$2,000)**
 - Simple, no maintenance, 20%-65% reductions
- **Closed crankcase filtration device (CCF - \$950 - \$2,000)**
 - 100% elimination of crankcase emissions
- **Auxiliary Power Units/Engine preheaters (\$1,200 - \$10,000)**
 - Eliminates need for idling and saves fuel
- **Diesel multi-stage filter (DMF - \$6,000 - \$8,000)**
 - More complicated selection, limited maintenance, 75% PM reduction
- **Diesel particulate filter (\$8,000 - \$10,000)**
 - Complicated selection and installation, requires maintenance, 60%-90% emissions reductions
- **Biodiesel fuels**
- **Ultra-low sulfur diesel fuel (ULSD)**
 - Standard on-road fuel in DMA and necessary for DMF/DPF

Funding Sources

- CMAQ through FHWA
 - Funds can be used for all equipment but not fuels
 - Requires minimum 20% local match
- EPA
 - Funds can be used for tailpipe equipment and fuels but not engine preheaters
 - Sometimes local match increases chance of award
- SEPS
 - Funds are specified for program by companies involved in settlement process
- Other funds
 - DOE and other agencies provide limited funds for these efforts

CAF Program Structure

- Clean Air Fleets Program has three main program elements
 - School buses (Clean Yellow Fleets for Blue Skies)
 - Other on-road vehicles (Colorado Retrofit Project)
 - Off-road HDDV (Diesel Initiative for Retrofit Technology)
- Rocky Mountain Clean Diesel Collaborative (RMCDC)
 - EPA Region 8, FHWA, CDPHE, CDOT, State of Utah, RAQC, C&C of Denver

Past Programs

- Clean Air Fleets Program (\$285K CMAQ,EPA, SEP)
 - 2003 – 2005: Retrofitted 11 DOC, 29 CCF and 29 preheaters and funded 19 biodiesel projects
 - Assisted RAQC with partnership development and program policy
- Clean Yellow Fleets for Blue Skies Program (\$1.6M CMAQ/EPA)
 - 2004 – 2006: Installed approximately 600 DOCS, 90 CCF and 360 preheaters on 800 buses
 - Purchased 220,000 gallons of biodiesel in 15 school districts
- Diesel Initiative for Retrofit Technology (D.I.R.T.) (\$85K EPA)
 - 2005 – 2007: Retrofitted 21 off-road vehicles with DOC/CCF at City of Commerce City and Brannan Sand & Gravel

Present Programs

- Clean Yellow Fleets for Blue Skies (\$1.2M CMAQ)
 - 2006 – 2008: Retrofitting school buses with additional 200 DOC, 260 CCF and 330 preheaters
- Colorado Retrofit Project (CORP) (\$2.3M CMAQ and SEP)
 - 2006 – 2008: Retrofitting public works vehicles with over 375 DOC, 140 CCF and 200 preheaters
- Pueblo Retrofit Project (\$450K SEP and Xcel donation)
 - 2006 – 2008: Retrofitting school and transit buses with DOC/CCF and preheaters
- APU Project (\$80K EPA)
 - 2007 – 2008: Retrofitted 9 OTR vehicles with APUs

Future Programs

- **New Energy Fleets Collaborative (\$5.3M CMAQ)**
 - Funding tentatively approved for 2009-2011 as part of DRCOG's 2008-2013 TIP
 - Purchasing a minimum of 3 electric buses and 20 diesel/hydraulic vehicles
 - 420 DOC/CCF, 40 DMF, 20 DPF and 300 engine preheaters
 - E85 infrastructure
 - Assist with the repair of a minimum of 200 gasoline powered high-emitters

Future Programs – cont.

- **Discussing implementation of an Idling Reduction and Retrofit Program**
 - Collaborative effort between citizens, Denver, Jeffco, EPA and RAQC focusing on Swansea and Mitchell schools
 - Voluntary effort to change idling behavior
 - Collaborative has discussed idling reduction, retrofits, street sanding around school and tree planting
- **DERA Funding**
 - Working with Colorado Contractors Association, Truckers and more school bus and public works retrofits

Outreach

- Recruit fleets through all avenues
- Rocky Mountain Clean Diesel Collaborative
- Held media events and a school fleet awards ceremony
- Convened 3 conferences in Denver
 - Assisting in national and state conferences, trade shows, one on ones and industry publications
- Focus to continue replication outside Denver area
 - RAQC project brought about partnership with CDPHE on Pueblo project
 - RAQC offers technical assistance to Pueblo schools and City of Aspen and has influenced projects in Ohio, Idaho and Utah
- Outreach has brought about interest from private sector

Challenges and Successes

- Program challenges include:
 - Private sector involvement but that is changing
 - Meeting multiple fleet's equipment needs
 - Financial management with so many agencies involved
- Program success based on:
 - Fleets dedication and leadership
 - Communication and outreach
 - Voluntary effort
 - Collaborative partnerships through federal, state, regional and local agencies and the private sector
 - RAQC success in fund-raising
 - Flexibility as program matures

Program Partners

School Districts:

- Aurora Public Schools
- Adams County School District 50
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- Adams County School District 50
- Adams Twelve Five Star Schools
- Cherry Creek Schools
- Denver Public Schools
- Littleton Public Schools
- Douglas County School District
- Jefferson County Public Schools
- Mapleton Public Schools (Adams Cty 1)
- Thompson Valley Schools
- St. Vrain Valley School District RE-1J

Private Companies:

- Brannan Sand and Gravel
- 10 trucking companies

State and Local Governments:

- City of Aurora Public Works Dept.
- City of Arvada Public Works Dept.
- City of Boulder Public Works Dept.
- Boulder County Public Works Dept.
- City of Brighton Public Works Dept.
- City of Broomfield Public Works Dept.
- City of Castle Rock Public Works Dept.
- Colorado Department of Transportation
- Colorado Department of Personnel Division of Central Services
- City and County of Denver Public Works Dept.
- City of Englewood Public Works Dept.
- Lakewood Public Works Dept.
- City of Littleton Public Works Dept.
- City of Louisville Public Works Dept.
- City of Thornton Public Works Dept.

Program Assessment

- Built program over 4 years to include 40 fleets
- Will install minimum of 1,600 DOC, 960 CCF, 40 DMF, 20 DPF and 1,200 preheaters by 2011
- RAQC has expended or allocated ~\$11M through 2011
 - These include CMAQ, EPA and SEP funds and local match
- Displaced 240,000 gallons of fuel with biodiesel
 - 9 APUs reduce fuel usage by maximum 24,000 gallons annually
 - Installed preheaters reduce fuel usage ~150,000 gallons annually
- Reduced exposure for a minimum of 48,000 children
- Implemented projects reduced up to 7.5 TPY PM, 170 TPY HC, 1,800 TPY CO and 0.5 TPY NO_x
 - Program benefits last a minimum of 3 – 5 years