

US EPA ARCHIVE DOCUMENT

**Project Green Fleet  
Diesel Emission Reduction Strategy  
for the State of Minnesota**

January 22, 2009

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## Introduction

Project Green Fleet (PGF) is a collaborative effort in the state of Minnesota aimed at reducing emissions from diesel fleets.<sup>1</sup> PGF is a partnership that includes local, state, tribal, and federal government, private sector, and non-governmental organizations. PGF is a unique program, because Minnesota is in attainment of National Ambient Air Quality Standards (NAAQS) and every partner, whether as a funder or as a participant, is engaging voluntarily. Given Minnesota's attainment status, private resources and partnerships will remain the key, driving factor in sustaining and expanding PGF's work. PGF is a pioneering, proactive diesel emission-reduction effort and serves as a national model for voluntary, partnership-based solutions to some of our most pressing air quality challenges. This collaborative approach will raise PGF's partnership and diesel emission-reduction work in Minnesota to a new scale – extending current success into new territory, minimizing risk and inefficiency, leveraging extraordinary levels of public and private resources and significantly reducing diesel emissions and the associated health and environmental risks.

Working through Project Green Fleet and focusing primarily on mobile sources, Minnesota's diesel emission reduction strategy has four foundational, overarching goals. The goals are to:

- 1. maximize diesel emission reductions by utilizing the most feasible, economical and appropriate technologies or processes. And, when practical, apply these strategies to other mobile sources.**
- 2. obtain the greatest number of health, economic, and education co-benefits.**
- 3. leverage public, private, local, state and federal resources.**
- 4. identify opportunities for new partners and new emission-reduction work.**

Even with EPA engine standards taking effect to address on-road, non-road, locomotive and marine engines, millions of older, existing engines will continue to operate. Emissions can be reduced and efficiencies gained by taking actions to address these legacy vehicles.<sup>2</sup> Actions can include the installation of after treatment technologies, repowers, replacements, the use of cleaner fuels, and the institution of policies and practices that will reduce diesel emissions.

Project Green Fleet and this collaboration are committed to optimizing air quality and minimizing diesel air pollutant health risks for all Minnesotans. PGF is dedicated to increasing protections for Minnesotans who are most susceptible to air pollutant health risks such as children, the elderly, people with asthma and other respiratory diseases, and those facing increased exposure.

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<sup>1</sup> PGF is a program of Clean Air Minnesota (CAM), operated by the Minnesota Environmental Initiative. For more details, see [www.mn-ei.org/cam/about.html](http://www.mn-ei.org/cam/about.html). For a list of CAM partners, see attachment 4. For a list of participating PGF school districts and fleets, see attachment 5.

<sup>2</sup> The MPCA has agreed to support these efforts through the Environmental Performance Partnership Agreement (EnPPA) with U.S. EPA Region 5. More information at <http://www.pca.state.mn.us/programs/enppa.html>

PGF's initial objectives are to:

- retrofit all eligible diesel school bus and Head Start engines, and moving to other targeted on- and off-road vehicles.
- increase use of auxiliary power units (APU's) and/or EPA SmartWay Transport Partnership technology.
- expand driver idle-reduction training.
- target emission-reduction work in new sectors, such as port operations, heavy construction equipment and specific sector-based initiatives, such as solid waste collection vehicles. See attachment 1 for sector descriptions.

This collaborative strategy will scale-up, accelerate, and guide clean diesel action in Minnesota. This strategy provides broad direction and emphasis to create sustainable clean diesel activities and to establish funding sources. To create a comprehensive clean diesel approach in Minnesota, PGF and its partners will work to generate emission-reduction projects and to assist with staffing, technical information, guidance, and funding.

This strategy and its collaborative approach through PGF, will:

- Create a network of clean diesel projects within Minnesota
- Educate partners and develop educational opportunities for others
- Develop funding mechanisms for clean diesel actions
- Identify interested fleets and other opportunities for clean diesel actions
- Implement clean diesel projects
- Track and report quantified exposure and emission reductions to the partners

### **Maximize Emission Reductions**

The analysis, tactics, and implementation efforts included in this strategy will take a mobile source sector-by-sector approach in order to address the challenges and opportunities for emissions-reduction specific to each unique sector. In this way, PGF will maximize results and the partners participating in the effort will be more diverse. As sectors are identified, champions can be cultivated to build momentum and ensure full participation throughout Minnesota. The sectors refer to various mobile source segments such as heavy-duty trucks, personal cars, fleets, construction equipment, farm implements, rail, port sources, and airport vehicles. Within each sector, the aim is to craft viable, long-term projects to reach the maximum number of vehicles or engines with the minimum outlay of resources for the greatest emission and exposure reductions.

The review and analysis process will evaluate implementation actions, tactics, and work plans based on the following criteria and select the most effective projects to push forward. The analysis will rely on the following criteria:

- Elicit partnership-based action
- Incorporate a variety of new and existing partners toward collaborative solution
- Achieve measurable emission reduction with potential for permanent reductions
- Balance implementation costs with emission reduction potential
- Have potential to realize co-benefits (emission, health exposure, financial, etc.)
- Have funding potential
- Have potential to be scaled up from pilot- to large-scale

Attachments 1 and 2 provided at the end of this document are potential evaluation and data gathering tools that may be employed to assess projects and assist with quantifying emission results.

### Co-benefits

In addition to environmental benefits, these projects will strive to obtain health, economic and educational co-benefits. This strategy targets particulate matter and carbon reductions. PGF, MPCA, and partner outreach and education efforts will be leveraged, maximizing the impact of retrofitting or other activities. The actions described in this strategy will also provide significant climate change benefits. These activities generate important black carbon reductions, which have been found to have large, immediate and lasting climate change benefits.<sup>3</sup>

To optimize the public health benefits, PGF will also prioritize working with organizations that have identified regional or community-scale areas as Diesel Emission-Reduction Areas. This designation is typically based on information such as population density, proximity to sensitive populations, air quality indicators, and school locations. Diesel fleets or engines located in proximity to, or providing services within and through such an area will be sought out as partners in improving the public's health.

Co-benefits include:

- Greater awareness of air quality and health issues from education and outreach activities in project communities.
- Emission reductions and health benefits will be leveraged through work with the Minnesota Pollution Control Agency, the Minnesota Department of Health and other partners.
- Gains criteria pollutants, black carbon emission reductions.
- Achieves objectives and recommendations from the Minnesota Climate Change Advisory Group Process.<sup>4</sup>

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<sup>3</sup> see recent studies regarding black carbon's relation to climate change: recent NASA study on climate projections, [www.climate-science.gov/Library/sap/sap3-2/final-report/sap3-2-final-report-all.pdf](http://www.climate-science.gov/Library/sap/sap3-2/final-report/sap3-2-final-report-all.pdf); [www.nature.com/ngen/journal/v1/n4/pdf/ngen156.pdf](http://www.nature.com/ngen/journal/v1/n4/pdf/ngen156.pdf); and House Oversight Committee Hearing testimony, <http://oversight.house.gov/story.asp?ID=1550>

<sup>4</sup> More information at <http://www.mnclimatechange.us/>



## Leveraging Resources

This strategy provides significant advantages for partners and Minnesota.

Specific actions within the partnership include:

- Continued efforts to educate participants on Congestion Mitigation and Air Quality funding opportunities and assistance with partnering and application development.
- Generate state and local funding source for clean diesel actions.
- Connect participants with state and federal supplemental environmental project (SEP) funds.
- Create innovative financing mechanisms to scale up impacted number of vehicles.
- Engage public and private sector partners in clean diesel opportunities.
- Access to Supplemental Environmental Projects. The Minnesota Pollution Control Agency (MPCA) will offer diesel retrofits, installation of Auxiliary Power Units and other diesel reduction activities as a SEP, at every applicable enforcement opportunity.

Partners can:

- Utilize existing, proven statewide outreach, procurement and installation systems.
- Communicate funding opportunities between partners.
- Leverage resources from an extensive and long-standing public/private partnership enabling the projects to generate immediate diesel reductions.
- Enhance and share education resources on air quality, health and idle reduction. Partners can use materials from Hamline University's Center for Global Environmental Education, the Minnesota Department of Health, the City of Minneapolis, the MPCA, and the EPA.

In addition, these collective actions and tactics coordinated through PGF:

- Position Minnesota to receive greater investments in diesel retrofits through leveraged state, private and local government investments.
- Provide greater opportunities for leveraging private funding and grants from multiple EPA regions (EPA Region 5's Midwest Clean Diesel Initiative, EPA Regions' 6 and 7 Blue Skyway Collaborative), the SmartWay Transport Program, and CenSARA.
- Align with goals of MPCA, EPA, and PGF partners.

## New Partners and New Emission-Reduction Work

Partners are encouraged to share information, tools, and technical and policy assistance. Partners can learn from other state clean diesel coalitions, work together to address common issues and provide common opportunities. PGF and its partners will identify high profile and high-return project areas. As feasible, the collaboration will look to implement projects with emerging technologies and to work across programs, agencies and other boundaries to partner on new areas of concern or emerging areas of common interest.

Benefits from this strategy include:

- Integration of clean diesel actions into local, state, and federal planning and mitigation activities and climate change plans.
- Tracking and reporting of projects, emissions reductions and fuel saving from clean diesel actions.
- Creation of innovative funding programs.

## Diesel Emission-Reduction Sector Options

The following offers a description of several on-road and non-road strategies and associated actions/programs that could be employed to achieve diesel emission reductions. Some of these strategies are currently underway in Minnesota, while others are opportunities identified from State Implementation Plans and similar emission-reduction programs in other states. Where applicable, past efforts and planned objectives for 2009 are provided. These sector options (provided in no particular order) are part of a living document that will be modified as new funding opportunities and projects arise. As efforts expand into new areas, sector-based plans may be developed to address specific targets. Attachment 3 provides a summary of some diesel sectors, and areas where project opportunities exist.

### On-Road Strategies

#### **“Clean diesel” replacements and retrofits for heavy duty buses and trucks**

- a. Retrofit technology on school bus fleets (*combination of public and privately owned*)
- b. Retrofit technology on government owned vehicles (*municipal, county fleets*)
- c. Voluntary Diesel Emissions Reduction Programs for Private Vehicles (*grant or loan programs, with educational component*)
- d. Combining Private Financing with Government Grants (*innovative funding for public and private on-road diesel retrofits*)

#### 2009 Objectives:

*School Bus Retrofit program:* By the end of 2008, PGF retrofit over 1200 school buses in 44 Minnesota school districts<sup>5</sup> and 2 Head Start programs (30% of the legacy fleet) with Diesel Oxidation Catalysts (DOCs) and/or Crankcase Filtration Systems. In 2009, this work will continue with funding support from U.S. EPA Region 5, state, and private resources. Depending upon available funds, a minimum of 600 additional retrofits are planned in 20+ districts. As part of this effort, PGF also works with participating districts on establishing idling guidelines.

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<sup>5</sup> For a list of participating PGF partners, see attachment 5.

*Heavy duty public fleets:* Through a Congestion Mitigation Air Quality (CMAQ) grant, MPCA is coordinating the retrofit of a minimum of 200 on-road diesel vehicles from several Twin Cities public fleets with DOCs. PGF and its partners will continue to identify opportunities to work with public fleets and utilize available funds to retrofit vehicles. PGF is also U.S. EPA funds to retrofit a metro area municipal fleet.

**Reduce Idling from Public and Private Fleets, utilizing existing resources and venues for information dissemination where possible** (such as associations, technical colleges, EPA programs – SmartWay Transport Partnership)

- a. Statewide School Bus Idling Guidelines (*voluntary idling time limits - work with associations and existing legislation*)
- b. Idle Reduction Regulations for Transit and Other Public Fleets (*voluntary idling time limits - work with associations and existing legislation*)
- c. Loan Program to Reduce Idling (*funding for cab heaters, auxiliary power units, etc.*)
- d. Promote adoption of internal idling policies for municipalities
- e. Voluntary Anti-Idling Program with Educational Outreach (*voluntary idling time limits*)
- f. Revolving Loan or Other Program for Idle-reduction Equipment (*funding for cab heaters, auxiliary power units, etc.*)
- g. Target appropriate vocational training and education programs.
- h. Promote EPA's voluntary Smartway Transport Program to Minnesota-based companies

2009 Objectives:

*Fleet Management Event:* PGF, through Clean Air Minnesota, is planning a series of half-day fleet emission reduction events around the state in 2009. This project would work with various partners including Minnesota WasteWise, various chambers of commerce, the Minnesota Trucking Association, the EPA, MPCA and technology vendors to identify emission-reduction issues and technology status and needs. Strategies developed around these issues would be delivered to public and private fleet owners, industry representatives, government agency representatives, and others at a technology event. Follow up would include the implementation of new technologies and quantification of emission reductions.

*APU Loan Program:* MPCA, with the infusion of U.S. EPA Region 5 funds, will establish a separate revolving loan fund for purchase of Auxiliary Power Units by small Minnesota trucking companies and independent truckers. This effort builds on the current Small Business Loan program that has awarded low-interest loans to truckers since 2006.

**Truck Stop Electrification (TSE)**

- a. Identify Key Sites for TSE (Providing electric hook-up power at truck stops, rest areas, highway locations, etc.)
- b. Financing Program for TSE (Public and private funding)
- c. Require New Truck Stops to Include TSE Infrastructure

**Alternative Fuels and Electric Vehicles (public and private fleets)**

- a. Increased Use of Ethanol (E85)
- b. Increased Use of Biodiesel
- c. Increased Use of Hybrid and Electric Vehicles
- d. Compressed Natural Gas

**Comprehensive Fleet Review and Transportation Projects**

- a. Fleet size requirements and benefits
- b. Type
- c. Use/Practices/Maintenance

See Fleet Management Event.

**Non-Road Strategies****Public Works Projects**

- a. Emissions Performance Specifications in Contracts for Public Works Projects
- b. Use of Biodiesel
- c. Contract Requirements for Public Projects Using Private Fleets (*limit idling time for construction equipment*)

**2009 Objectives:**

*Pilot scale project:* Create pilot-scale project with a construction project to establish diesel emission limits, idle reduction requirements, and/or equipment requirements that will result in diesel emission reductions. Ultimately, the pilot project would lead to diesel emissions limits and/or equipment requirements and/or contract bonus points for construction equipment on all large public works projects

**Financing and Assistance**

- a. Combining Private Financing with Government Grants (*innovative funding for public and private non-road diesel retrofits*)
- b. Low Interest Financing (*funding for state and local governments*)
- c. Technical Assistance to Construction Equipment Owners (*education outreach*)

**2009 Objectives:**

*Non-road retrofits:* PGF is utilizing U.S. EPA Region 5 funds to work with private construction firms to retrofit off-road equipment.

**Ports**

- a. Truck Traffic Idle-reduction policies (*Limit idling time while waiting for (un)loading*)
- b. Equipment practices (idle reduction)
- c. Alternative fuel
- d. Equipment retrofits

**Locomotives**

- a. Reduce Idling from Switchyard and Line-Haul Locomotives

**Airports**

- a. Ground Support Equipment (GSE) Replacement with Electric, CNG, or Other Clean Technology (*Low-emission baggage carts, fuel trucks, etc., with potential funding available through the federal Voluntary Airport Low Emissions (VALE) Program?*)
- b. Idle-reduction practices

**Stationary Diesel Generators**

- a. Retrofit technology
- b. Alternative fuels
- c. Use parameters

2009 Objective:

*Hospital Clean Diesel Zones Project:* If funding is identified, this project, modeled after a West Coast Diesel Collaborative project, would introduce an array of diesel emission reduction opportunities to hospital facilities and campuses to address patient transportation, goods and services delivery, construction activities and stand-by power generation. Emission-reduction targets would include hospital equipment, vendors and construction activity on and around hospital facilities.

**Additional Strategies:****Consider Emerging Technologies**

- a. See EPA Emerging Technologies list
- b. Opportunities to collaborate with the University of Minnesota, Center for Diesel Research

**Neighborhood Scale Involvement**2009 Objective:

*CAIP:* MPCA is leading an effort to address air quality issues on a neighborhood scale through the Community Air Improvement Program (CAIP). Several PGF/CAM partners are involved in this effort, as well as community leaders and organizations from a 4 neighborhood focused area of Minneapolis. Diesel emission reduction and idle reduction have been identified by CAIP members as a priority area, and efforts are underway in 2009 to identify how current diesel activities could be incorporated into this project.

**Attachments**

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**Attachment 1: Project Evaluation Template**

**Project Title:**

**Description:**

**Target Pollutant(s):** (including co-benefits)

Objective	Strategy to Achieve Objective	Measures of success	Potential Barriers
Elicits voluntary action			
Incorporates a variety of new and existing partners toward collaborative solution			
Achieves measurable emission reduction with potential for permanent reductions			
Balances implementation costs with emission reduction potential			
Has potential to realize co-benefits (emissions, health exposure, financial, etc.)			
Has funding potential			
Project concept can be scaled up from pilot- to large-scale			

**Implementation Considerations:**

**Project Strengths:**

**Project Weaknesses:**

**Recommendation:**





**Attachment 3: Summary of Diesel Project Opportunities**

<b>On-Road</b>	Idle Reduction	Alternative Fuels	Inspection & Maintenance Programs	Exchange Programs	Traffic Management	Retrofit Programs	Operational Practices
Heavy Duty Diesel Vehicles	✓	✓	✓		✓	✓	✓
Heavy Duty Diesel Buses	✓	✓	✓		✓	✓	✓
Light Duty Diesel Trucks	✓	✓	✓		✓		✓
Light Duty Diesel Vehicles	✓	✓	✓		✓		✓
<b>Non-Road</b>							
Agricultural Equipment	✓	✓	✓			✓	
Locomotive Emissions	✓	✓	✓			✓	
Construction and Mining Equipment	✓	✓	✓			✓	
Industrial Equipment	✓	✓	✓			✓	
Commercial Equipment		✓	✓			✓	✓
Commercial Marine Vessel	✓	✓	✓			✓	
Airport Including Ground Support Equipment	✓	✓	✓				
Logging Equipment	✓	✓	✓			✓	
Railway Maintenance	✓	✓				✓	

**Attachment 4: Clean Air Minnesota/Project Green Fleet Partners**

- |   |   |
|---|---|
| 494 Transportation Management Organization                  | Merit Printing  |
| Ambassador Press  | Minnesota Brokerage Group   |
| American Express Financial Advisors                         | Minnesota Department of Health, Environmental Health Division         |
| Andersen Corporation  | Minnesota Environmental Initiative                                    |
| Applied Graphics Associates                                 | Minnesota Office of Environmental Assistance                          |
| Barr Engineering  | Minnesota Pollution Control Agency                                    |
| Best Buy Company  | Minnesota Power   |
| Blue Cross and Blue Shield of Minnesota Foundation          | Minnesota Department of Administration                                |
| BP  | Minnesota Technical Assistance Program at the University of Minnesota |
| Chemical Marketing Corporation                              | Minnesota Trucking Association  |
| Cities Management   | Mississippi Corridor Neighborhood Coalition                           |
| City of Minneapolis   | Neighborhood Energy Consortium  |
| Covanta/Hennepin Energy Resource Company                    | NRG Energy Center   |
| Creative Engine Air Management                              | Printing Industry of Minnesota  |
| Cypress Semiconductors                                      | Ramsey County   |
| Delta Environmental Consultants                             | Rochester Public Utilities  |
| Downtown Minneapolis Transportation Management Organization | Rock-Tenn Company   |
| Flaire Print Communications                                 | Rosemount Inc.  |
| Flint Hill Resources  | School of Environmental Studies                                       |
| Ford Motor Company  | St. Paul College  |
| Fortin Consulting   | Star Tribune  |
| Franklin Press  | Summit Printing   |
| Frattallone's Ace Hardware & Garden                         | Target  |
| Genmar Holdings   | Technology North  |
| Gillette Children's Hospital                                | U.S. Environmental Protection Agency Regions 5, 6 & 7                 |
| Great River Greening  | Unisys Corporation  |
| The Green Institute   | University of St. Thomas  |
| Hennepin County Department of Environmental Services        | University of Minnesota   |
| Izaak Walton League of America -- Midwest Office            | Ver-Tech Labs   |
| The John Roberts Company                                    | The Water Foundation  |
| Johnson Senior High School                                  | Washington County   |
| Kueppers Real Estate  | White Bear Racquet & Swim   |
| Mayo Clinic Foundation                                      | Women's Cancer Research Center  |
| Medtronic Inc.  | Woodwinds Health Campus   |
|   | Xcel Energy   |

\* Some partners are also sponsors/funders of Project Green Fleet activities.

**Attachment 5: PGF participating fleet owners, operators, and school districts**

- |   |   |
|---|---|
| Annandale Public School District                          | Sartell-St Stephen Public School District               |
| Anoka-Hennepin Public School District                     | South Washington County Public School District          |
| Bemidji Public School District                            | St Anthony-New Brighton Public School District          |
| Big Lake Public School District                           | St Louis Park Public School District                    |
| Braham Public School District                             | St Paul Public School District                          |
| Burnsville-Eagan-Savage Public School District            | Waconia Public School District                          |
| Cass Lake-Bena Public School District                     | Walker-Hackensack-Akeley Public School District         |
| Columbia Heights Public School District                   | Wayzata Public School District                          |
| Crosby-Ironton Public School District                     | Community Action Partners of Ramsey & Washington County |
| Deer River Public School District                         | Fond du Lac Head Start                                  |
| Duluth Public School District                             | Bug-O-Nay-Ge-Shig School                                |
| Eden Prarie Public School District                        | First Student, Inc.                                     |
| Edina Public School District                              | Nor-Tran Bus Company                                    |
| Elk River Public School District                          | Voyageur Bus Company                                    |
| Houston Public School District                            | M&M Bus Company   |
| Hutchinson Public School District                         | Kottke's Bus Company                                    |
| Lake City Public School District                          | Vision Transportation Service                           |
| Maple Lake Public School District                         | Braham Bus Company                                      |
| Marshall Public School District                           | Riggles Bus Company                                     |
| Minneapolis Public School District                        | Crosby-Ironton Transportation                           |
| Minnetonka Public School District                         | Lake City Bus Lines                                     |
| Monticello Public School District                         | Southwest Coaches                                       |
| Mounds View Public School District                        | Monarch Bus Service                                     |
| North Saint Paul-Maplewood-Oakdale Public School District | Hoglund Transportation                                  |
| Northfield Public School District                         | Benjamin Bus  |
| Orono Public School District                              | Paynesville Motor & Transfer                            |
| Paynesville Public School District                        | Koch School Bus Service                                 |
| Rochester Public School District                          |   |
| Rosemount-Apple Valley-Eagan                              |   |

\*List is current as of January 22, 2009

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