

# 2014 DOE Vehicle Technologies Office Merit Review

## Alternative Fuel Market Development Program - Forwarding Wisconsin's Fuel Choice

**Presenters:**

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**&**

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**June 19<sup>th</sup>, 2014**

**Project ID #  
Tl046**



# OVERVIEW

## Timeline

- Start Date – 02/01/2013
- End Date – 01/31/2015
- 65% complete

## Budget

- Total project funding:
  - \$510,000
  - DOE = \$500,000
  - Cost Share = \$10,000
- Funding with FY13/FY14 funds = \$120,188.45 spent (24%) (as of 03/27/14)

## Barriers Addressed

- Consumer reluctance to purchase new technologies
- Lack of technical experience with new fuels and vehicle technologies
- Availability of AFVs/EVs and associated infrastructure

## Partners

- WI Clean Cities
- WI Technical College System
- 27+ Public & Private Fleets in WI

# RELEVANCE

## Objectives

Target and remedy obstacles to alternative fuel vehicle adoption and use by identifying, developing, updating, and modifying local/regional/state:

- Policy initiatives;
- Barriers to the use of alternative fuel vehicles;
- Training; and,
- Outreach, education, and coordination.

## Program Support of VTP Deployment Goals:

- Supports Clean Cities efforts to displace petroleum through the use of alternative fuels and AFVs, idle reduction technologies, fuel economy measures, and fuel blends;
- Supports implementation programs that help to transition alternative fuels and vehicles into the marketplace; and
- Collaborates with its industry and academic partners to increase training and education efforts.

# MILESTONES

| Month/Year | Milestone  |
|------------|--|
| Jan-14     | Expansion of road signage for alternative fuel stations (in-progress)  |
| Jan-14     | Wisconsin Smart Fleet Program – complete 20 fleet assessments (in-progress)  |
| Jan-14     | Adoption Barriers to Fuel Retailers and Distributors (in-progress)   |
| Jan-14     | Safety and Training Initiatives (in-progress)  |
| Jan -15    | Overcoming challenges with adopting policy on the local level, both public and private: <ul style="list-style-type: none"> <li>• matrix of for public and private fleets,</li> <li>• inventory of their current policies and procedures; and</li> <li>• list of best practices for fleet-specific implementation plan (in progress)</li> </ul> |
| Jan-15     | Market Development/Outreach Initiatives (in-progress)  |
| Jan -15    | Inventory and Stakeholder Feedback Statewide Law and Incentive Programs (ongoing)  |

# PROJECT APPROACH & DEPLOYMENT

## **Task 1.0 Project Management and Administration**

Manage project planning and execution activities in order to achieve project objectives.

## **Task 2.0 – Policy Initiatives**

Create an inventory of statewide law/incentive programs; meet with fleets and inventory current policies; and, recommend ways to expand road signage for alternative fuel stations.

## **Task 3.0 – Barrier Reduction Initiatives**

Launch the WI Smart Fleet Program and survey fuel retailers/distributors regarding adoption barriers.

## **Task 4.0 Safety and Training Initiatives**

Create an inventory of currently available training; develop training to fill existing gaps; and, schedule trainings for first responders, safety and maintenance.

## **Task 5.0 – Market Development/Outreach Initiatives**

Address outreach and education regarding the use of alternative fuel vehicles through a dedicated web site, educational workshops and events, published articles and social media.

# ACCOMPLISHMENTS

**WISCONSIN  
SMART FLEET**

[WHAT IS A  
SMART FLEET?](#)

[BECOME A  
SMART FLEET](#)

[MEET THE  
FLEETS](#)

[NEWS &  
EVENTS](#)

[RESOURCES  
& LINKS](#)

[CONTACT  
US](#)



## What is a Smart Fleet?

### Benefits of being a Smart Fleet ...

#### Reduce Carbon Footprint

Learn how to reduce harmful emissions, increase energy security, and contribute towards a growing economy in Wisconsin.



#### Meet Internal Economic Goals

Learn how to reduce dependence on

### What does it mean to be a Wisconsin Smart Fleet?

*A new program launched by the Wisconsin State Energy Office and Wisconsin Clean Cities is defining that label.*

Companies and governmental agencies talk a lot about being “green” or working towards “sustainability.” Whichever buzz word is applied means that, for most, the ultimate goals are to reduce their carbon footprint, leave the world a better place for the next generation, and meet their internal economic goals. To help fleets meet these goals, the Wisconsin State Energy Office (SEO) and Wisconsin Clean Cities (WCC) are setting out to provide fleets with a planning tool and outline the different options available for their specific situations. The SEO and WCC are calling it the Wisconsin Smart Fleet program.

# ACCOMPLISHMENTS

## Market Development/Outreach Initiatives

- Launched and promoted WI Smart Fleet Program.
- Included information regarding the FWFC program on WCC website
- Included information regarding the FWFC program on WCC Facebook, Twitter, YouTube & email marketing
- Highlighted at 11 events
- Hosted 5 webinars



# ACCOMPLISHMENTS

## Safety and Training Initiatives

- Heavy-Duty CNG train-the-trainer held January 19, 2014 in collaborations with Milwaukee Area Technical College and Cummins
- Running engine was invaluable to the training, participants able to test theories, understand the operating principles during fuel module disassembly and all computer diagnostic functions
- Shop supervisor from Paper Transport Inc . provided real life issues and solutions.

## Natural Gas

- What is natural gas?
- Where does it come from?
- Why are we here talking about it?
- Why do they call it Natural Gas?

MILWAUKEE AREA Technical College

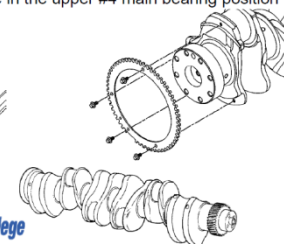
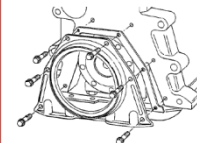
## Typical Natural Gas Engine Applications



MILWAUKEE AREA Technical College

## Crankshaft

- Forged-steel, full-fillet hardened, and integrally balanced
- Crankshaft Seals (Front and Rear)
- Drive gear at front (camshaft, lube pump)
- Tone wheel at rear (for engine speed & position)
- Crankshaft stroke is how we get the ISL out of the ISC block
- Thrust is 180° coverage in the upper #4 main bearing position



MILWAUKEE AREA Technical College





# ACCOMPLISHMENTS

## Media highlights

### Oshkosh, sheriff's department among first participants in alternative fuel program

3:19 PM, Feb. 11, 2014

Recommend



Matt Pohratz of the Oshkosh Sanitation Department fuels his refuse truck with compressed natural gas at the Kwik Tri on Washburn Street and State 44. Oshkosh is one of three charter members of Wisconsin Smart Fleet, a program that aims to highlight municipal and business fleets that use alternative fuels.



Batteries in stock and experts on staff.™

### News Release

January 20, 2014  
For Immediate Release

Contact  
Mike Moeller — [memoeller@remybattery.com](mailto:memoeller@remybattery.com)  
(414) 384-0340

### Remy Battery Recognized for Alternative Fuel Leadership in Wisconsin State Organizations Salute Battery Retailer for Conversion to CNG Vehicles

Milwaukee, WI — Remy Battery has been recognized by the Wisconsin Clean Transportation Program for its leadership in the advancement of alternative fuels and technology in the state of Wisconsin in 2013. Awards were presented at the Wisconsin Clean Cities annual stakeholders' meeting held in December at Lambeau Field in Green Bay. The event celebrated the efforts and accomplishments of Remy Battery and other Wisconsin fleets in moving toward the use of alternative fuels and cleaner air for Wisconsin.



### In the News

#### Outpost in the News

#### January

01/07/14 WI Smart Fleet Press Release

#### Outpost one of 29 businesses in initial WI Smart Fleet

The Wisconsin State Energy Office (SEO) and Wisconsin Clean Cities (WCC) announced the official launch of the Wisconsin Smart Fleet program and website, [www.wismartfleet.org](http://www.wismartfleet.org), Tuesday, Jan. 7, 2014.

The Wisconsin Smart Fleet program provides fleets with a planning tool and outlines different options to help Wisconsin fleets meet their internal economic goals while reducing their carbon footprint. The Wisconsin Smart Fleet program is initially inducting fleets with three or more vehicles.



#### NEWS

New Wisconsin initiative to encourage municipalities to switch to alternative fuel vehicles

BACK



**February 25, 2014.** Wisconsin Smart Fleet aims to evaluate government and business vehicle fleets to identify areas where they can add vehicles that run on alternative fuels like compressed natural gas (CNG) and propane.

The program, a joint effort from the State Energy Office and Wisconsin Clean Cities, already is conducting site visits to evaluate 29 participating vehicle fleets across the state that have started to reduce gasoline and diesel fuel consumption, reduce carbon footprints and reduce costs.

The program aims to recognize municipal fleets that embrace alternative fuel options and establish a network of early adapters who can provide guidance for other communities and businesses interested in reducing gasoline and diesel fuel consumption.

Three participating fleets, or more than 10 percent of the initial participants selected, are based in Oshkosh.

- The city of Oshkosh uses compressed natural gas, or CNG, to fuel garbage and recycling trucks and also has several hybrid buses.
- Winnebago County authorized Sheriff John Matz to convert eight squad cars to run on propane and to install a propane filling station at the Highway Department complex on County Y.



# COLLABORATIONS

## Project Management Team

- **WI State Energy Office** (primary recipient, state government): contract negotiations and compliance, invoicing and reimbursement, reporting.
- **WI Clean Cities** (sub-recipient, non-profit): co-project management, conducting/managing Wisconsin Smart Fleet Program, fuel retailer surveys, and education/outreach efforts
- **WI Technical College System** : (sub-recipient, state government) - coordination of training, specifically train-the-trainer programs at technical colleges throughout the state.

# COLLABORATIONS

**Wisconsin Smart Fleet Program Fleet Partners** (sub-recipients): responsible for providing data for fleet assessments and further implementation/deployment.

|                             |                                    |                      |
|-----------------------------|------------------------------------|----------------------|
| Barnes Green Energy         | County of La Crosse Highway Dept.  | Remy Battery, Inc.   |
| Bayfield County             | Crawford County                    | Time Transport       |
| City of Beloit              | Green Lake County Sheriff's Office | Union Cab            |
| City of Eau Claire          | Hortonville School District        | UW Oshkosh           |
| City of Marshfield          | Michels Corporation                | Village of DeForest  |
| City of Milwaukee           | Outpost Natural Foods              | Village of McFarland |
| City of Oshkosh             | Polk County                        | Dane County          |
| City of Prairie du Chien    | Port Washington Police Dept.       | Kwik Trip, Inc.      |
| Contract Transport Services | Portage County                     | Oconomowoc Utilities |

# ALTERNATIVE FUEL EXPANSION POTENTIAL

- **Remaining Project Activities:**
  - Work with partner fleets to complete assessments, prepare recommendations for each fleet – target completions September 2014;
  - Training – conduct two additional training events. With the WTCS, targeted to first responders and fleet manager;
  - Prepare white paper and recommendations for WI alternative fuels station signage expansion;
  - Continue education and outreach efforts ; and,
  - Collection and disseminations incentive and law matrix/inventories.
- **Challenges and barriers:**
  - WisDOT sign program data collection will be a challenge while they are out of contract .

# ALTERNATIVE FUEL EXPANSION POTENTIAL

## Impact and Replicability:

- Final recommendation documents will provide each partner a site-specific link between the alternative fuel/advanced vehicle technology and deployment feasibility within their fleet.
- The assessment form can be shared with fleets anywhere in the U.S. and will continue to be utilized once project is complete.
- Related projects (non-project funded):
  - Municipal Energy Efficiency Technical Assistance Pilot Program (MEETAPP) – fleet assessment tool will be used in the transportation component of this program, managed by the SEO

# Summary



- Considerable education and outreach completed and will continue.
- Interested fleets and continued opportunity for non-partner fleets with creation of new Wisconsin Smart Fleet program.
- Continued growth of portfolio of fuels supported by the US DOE
- Direct deployment of alternative fuels and advanced vehicle technologies and infrastructure supported through public and private partnerships.

# TECHNICAL BACK-UP

# TECHNICAL BACK-UP

## Sample of a Portion of Wisconsin Smart Fleet Assessment Tool (1 of 3):

C9    fx    To begin the audit process, please fill out as much information as possible on each tab of this spreadsheet before your scheduled on-site visit.

| AB                  | C  | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|---------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>Introduction</b> |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1                   | <i>Congratulations!</i> You're on your way to becoming a Wisconsin Smart Fleet!  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2                   | The Wisconsin Smart Fleet Program is designed to work with local fleets to help mitigate barriers to adopting alternative fuel and advanced technology vehicles, and create policies that support petroleum reduction.   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3                   | The first step is participating in a fleet audit that will serve as a baseline. Wisconsin Clean Cities and the Wisconsin State Energy Office will then use that information to work with you to create a strategy unique to your fleet's needs.  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4                   | To begin the audit process, please fill out as much information as possible on each tab of this spreadsheet before your scheduled on-site visit.   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 5                   | Your on-site visit is scheduled for: <input type="text"/>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 6                   | If you have any questions or concerns before your on-site visit, please contact Wisconsin Clean Cities at (414) 221-4487 or email <a href="mailto:smartfleets@wicleancities.org">smartfleets@wicleancities.org</a>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 7                   |   <p>The Wisconsin Smart Fleet Program is part of Forwarding Wisconsin's Fuel Choice, which is jointly administered by the State of Wisconsin Energy Office and Wisconsin Clean Cities. Forwarding Wisconsin's Fuel Choice is made possible through a grant from the U.S. Department of Energy's National Energy Technology Laboratory and Office of Energy Efficiency and Renewable Energy.</p> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |



# TECHNICAL BACK-UP

## Sample of a Portion of Wisconsin Smart Fleet Assessment Tool (2 of 3):

D8

| 2. Policies, Laws, and Incentives  |   |     |                                  |                        |  |  |  |  |  |  |  |  |
|--|---|-----|----------------------------------|------------------------|--|--|--|--|--|--|--|--|
| <b>Policies and Laws:</b>  |   |     |                                  |                        |  |  |  |  |  |  |  |  |
| Please share whether any part of your fleet's alternative fuel choices are the result of any of the following types of policies or laws. If so, please explain by describing the relevant program area and policy/law. |   |     |                                  |                        |  |  |  |  |  |  |  |  |
|  |   |     | Required?<br>(Y/N)               | If yes, please explain |  |  |  |  |  |  |  |  |
| 7  | Type  |     |                                  |                        |  |  |  |  |  |  |  |  |
| 8  | Internal  |     |                                  |                        |  |  |  |  |  |  |  |  |
| 9  | Federal Requirement   |     |                                  |                        |  |  |  |  |  |  |  |  |
| 0  | State Requirement   |     |                                  |                        |  |  |  |  |  |  |  |  |
| 1  | Local Requirement or Ordinance  |     |                                  |                        |  |  |  |  |  |  |  |  |
| <b>Incentives:</b>   |   |     |                                  |                        |  |  |  |  |  |  |  |  |
| Please indicate which incentives your company provides for employees.  |   |     |                                  |                        |  |  |  |  |  |  |  |  |
|  | Type  | Y/N | Description of incentive, impact |                        |  |  |  |  |  |  |  |  |
| 7  | Vehicle purchases   |     |                                  |                        |  |  |  |  |  |  |  |  |
| 8  | Fuel availability   |     |                                  |                        |  |  |  |  |  |  |  |  |
| 9  | Preferred parking   |     |                                  |                        |  |  |  |  |  |  |  |  |
| 0  | Carpooling/Carsharing or alternative forms of transit (i.e. public transit) |     |                                  |                        |  |  |  |  |  |  |  |  |
| 1  | Other:  |     |                                  |                        |  |  |  |  |  |  |  |  |
| 2  | Other:  |     |                                  |                        |  |  |  |  |  |  |  |  |
| 3  | Other:  |     |                                  |                        |  |  |  |  |  |  |  |  |
| 4  | Other:  |     |                                  |                        |  |  |  |  |  |  |  |  |



# TECHNICAL BACK-UP

## Sample Wisconsin Smart Fleet Rating Form (1 of 2):

### Summary

Fleet Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

Total Earned Points: **0**  
Wisconsin Smart Fleet Level: \_\_\_\_\_  
Re-certification Date: \_\_\_\_\_

Evaluated by: \_\_\_\_\_  
Evaluated on: \_\_\_\_\_

| Rating System |         |
|---------------|---------|
| Rating        | Points  |
| 5 Star        | 100 +   |
| 3 Star        | 67 - 99 |
| 1 Star        | 34 - 66 |
| Smart Starter | 0 - 33  |



If you have any questions or concerns about this evaluation or the process, please contact Wisconsin Clean Cities at (414) 221-2509 or email [info@wismartfleet.org](mailto:info@wismartfleet.org).



The Wisconsin Smart Fleet Program is part of Forwarding Wisconsin's Fuel Choice, which is jointly administered by the State of Wisconsin Energy Office and Wisconsin Clean Cities. Forwarding Wisconsin's Fuel Choice is made possible through a grant from the U.S. Department of Energy's National Energy Technology Laboratory and Office of Energy Efficiency and Renewable Energy.

# TECHNICAL BACK-UP

## Sample Wisconsin Smart Fleet Rating Form (2 of 2):

| 1. Vehicles   |                 |                                    |                              |
|---|-----------------|------------------------------------|------------------------------|
| Description   | Possible Points | Points Earned                      | Total                        |
| <b>Ratio of new AFVs and ATVs to total new vehicles:</b>  |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
| <b>Percent total applicable fleet that consists of AFVs and ATVs:</b>   |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
| <b>Percent AFVs that are dedicated fuel:</b>  |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
| <b>Percent planned vehicles that are smaller, have a higher estimated MPG, or are alternative fuels:</b>            |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
|   |                 |                                    | <b>Subtotal 0</b>            |
| *Heavy-duty vehicles must improve MPG by at least 2 MPG.<br>Light-duty vehicles must improve MPG by at least 5 MPG. |                 |                                    |                              |
| 2. Policies & Incentives  |                 |                                    |                              |
| Description   | Possible Points | Points Earned                      | Total                        |
| Green purchase policy   | 5               |                                    |                              |
| Car sharing/carpooling program  | 3               |                                    |                              |
| Vehicle purchase incentive  | 3               |                                    |                              |
| Fuel availability   | 3               |                                    |                              |
| Preferred parking   | 1               |                                    |                              |
| Other approved method   | 1               |                                    |                              |
|   |                 |                                    | <b>Subtotal 0</b>            |
| Policies and incentives are programs facilitated by the organization and can incur cost to the organization.        |                 |                                    |                              |
| 3. Fuel Usage   |                 |                                    |                              |
| Description   | Possible Points | Points Earned                      | Total                        |
| <b>Percent of alternative fuel used for total fuel usage:</b>   |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
| <b>Percent reduction of gasoline and diesel:</b>  |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 3               |                                    |                              |
| 61% - 90%   | 5               |                                    |                              |
| 91% - 100%  | 7               |                                    |                              |
|   |                 |                                    | <b>Subtotal 0</b>            |
| 4. On Board Equipment & Retrofits   |                 |                                    |                              |
| Description   | Possible Points | Points Earned                      | Total                        |
| <b>Percent of total fleet using idle reduction equipment</b>  |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 2               |                                    |                              |
| 61% - 90%   | 3               |                                    |                              |
| 91% - 100%  | 4               |                                    |                              |
| <b>Percent of total fleet using vehicle efficiency equipment</b>  |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 2               |                                    |                              |
| 61% - 90%   | 3               |                                    |                              |
| 91% - 100%  | 4               |                                    |                              |
| <b>Percent of total fleet using clean diesel retrofit equipment</b>   |                 |                                    |                              |
| 10% - 30%   | 1               |                                    |                              |
| 31% - 60%   | 2               |                                    |                              |
| 61% - 90%   | 3               |                                    |                              |
| 91% - 100%  | 4               |                                    |                              |
|   |                 |                                    | <b>Subtotal 0</b>            |
| <b>Possible idle reduction equipment:</b>   |                 |                                    |                              |
| Auxiliary Power Unit (APU) and Generator Sets (GS)  |                 |                                    |                              |
| Direct Heat with Thermal Storage Cooling  |                 |                                    |                              |
| Fuel Operated Heaters (FOH) aka Direct-Fire Heater (DFH)  |                 |                                    |                              |
| Battery Air Conditioning System (BAC)   |                 |                                    | Thermal Storage System (TSS) |
| <b>Possible vehicle efficiency equipment:</b>   |                 |                                    |                              |
| Cylinder Deactivation   |                 |                                    |                              |
| Tires - Auto Inflation Systems  |                 |                                    |                              |
| Tires - Low Rolling Resistance  |                 |                                    |                              |
| Trailer Aerodynamic Packages  |                 |                                    |                              |
| <b>Possible clean diesel retrofit equipment:</b>  |                 |                                    |                              |
| Diesel Oxidation Catalyst (DOC)   |                 | Closed Crankcase Ventilation (CCV) |                              |
| Diesel Particulate Filter - Active or Passive (DPF)   |                 | Exhaust Gas Recirculation (EGR)    |                              |
| Partial Diesel Particulate Filter - Partial or Flow-through (pDPF)  |                 | Lean NOx Catalyst (LNC)            |                              |
| Selective Catalytic Reduction (SCR)   |                 |                                    |                              |