

ROUNDY'S SUPERMARKETS, INC.

Pick 'n Save · Copps · Metro Market · Mariano's

2014 Green Tier Annual Report

**Roundy's Oconomowoc Distribution Center
Oconomowoc, Wisconsin**

July 2015



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Annual Report**

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1. Executive Summary

Roundy's Supermarkets, Inc. (Roundy's) is pleased to provide its eighth Annual Report under Green Tier. This report covers the activities and accomplishments related to the Roundy's Oconomowoc Distribution Center, a Green Tier participant since December 22, 2006.

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2. Business Overview

Headquartered in Milwaukee, Wisconsin, Roundy's is one of the Midwest's oldest and largest grocers. As of May 1, 2015, the company owns and operates 150 retail grocery stores in Wisconsin and Illinois under the Pick 'n Save, Copps Food Center, Mariano's and Metro Market banners. In 2014, Roundy's opened sixteen new stores in Illinois, further expanding its presence in the Midwest.

This results-driven company emphasizes its customers, communities and respect for its employees. Its commitment to the environment and its people begins with its upper management and permeates throughout the organization. Roundy's adopted Code of Business Conduct posted on its website affirms that sound waste management, recycling and energy conservation are legal, ethical and business requirements.

By the end of 2014, the Roundy's private label included eleven brands ranging from Roundy's Organic and Roundy's Select to Roundy's Pet Care and Clear Value. Many of Roundy's signature items are made in its food processing plant in Kenosha, Wisconsin. In addition, Roundy's operates two Wisconsin distribution centers, including the 1.1 million square foot Oconomowoc Distribution Center facility opened in April, 2005.

In 2014, Roundy's had nearly \$4 billion in sales and almost 22,000 employees. The company has always strived to be a good neighbor, a positive influence on the community and to be a good environmental steward. Roundy's continues to show its commitment with involvement as a Green Tier participant

2.1 Roundy's Supermarkets Inc. Corporate-wide Continual Improvement

Although this annual report is largely focused on the Oconomowoc Distribution Center's Green Tier accomplishments, Roundy's continues to establish and implement energy-saving and environmentally conscious programs across our organization.

2.1.1 Wisconsin Partners for Clean Air¹ Partnership

The Wisconsin Partners for Clean Air ("WPCA") honors those businesses and organizations that have undertaken innovative strategies in the previous year to reduce harmful emissions. Roundy's won the 2014 Clean Air Recognition Award for its commitment in areas such as environmentally friendly refrigeration and use of LED lighting, among many other efforts.² Roundy's was selected to receive a WPCA Recognition Award in 2011 based upon its demonstrated commitment to reducing emissions through voluntary actions.

2.1.2 New and Existing Store Initiatives

Facility Management Systems (FMS) Update

All of Roundy's facilities -- retail stores, commissary and distribution centers -- are monitored through Energy Star's Portfolio Manager System. Based on the Energy Star criteria, Roundy's currently has nine locations that qualify for the Energy Star certification. To date, Roundy's has installed an FMS (building automation system) in 68 stores, which includes the addition of eight new stores in 2014. Though eight were added, Roundy's no longer operates in Minnesota resulting in the elimination of six systems. The systems monitor, manage and control the lighting, heating, ventilation, and air conditioning (HVAC), refrigeration, department fan hoods, ceiling fans and sub-metering of electric and water.

In 2012, Roundy's evaluated the use of a complete CO₂ refrigeration design at store level. In 2013 the system was installed in the new Menomonee Falls Pick 'n Save store (which opened in January, 2014). The Menomonee Falls Pick 'n Save refrigeration system utilizes CO₂, an alternative to HFC (hydro-fluorocarbon) refrigerants. After analyzing the results of this system, Roundy's has decided to utilize it in all new stores, starting with those opening in 2016. The use of the CO₂ system is detailed in the WPCA Nominating Paper attached as Appendix E. Roundy's is also

¹ The WPCA program is a coalition of about 250 businesses, community organizations, schools and government agencies committed to improving air quality through voluntary action. WPCA educates Wisconsin businesses and residents on air quality issues and works to effect behavior to improve air quality and reduce harmful air emissions as required by Wisconsin's state implementation plan under the federal Clean Air Act. See <http://www.cleanairwisconsin.org/businesses/aboutus.php>

² Nomination Paper for the award is attached as Appendix E.

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using the new stores to test an array of technologies to help increase energy efficiency including new refrigerated cases, LEDs, and rack and case controllers.

"We strive not only to give our customers a great shopping experience, but also to contribute to the communities in which we do business. Through our investment in these sustainable technologies we're also able to do something good for our global community," said Robert Mariano, chairman, president and chief executive officer of Roundy's.

LED (Light Emitting Diode) Technology

LED design standards have been in place for several years for certain store areas, including produce, liquor, frozen door cases, exit signs and building signage. Roundy's has since added LED design standards to open multi-deck cases and walk in coolers/freezers. New in 2014 has been the integration of LED lighting in exterior parking lot lighting. Roundy's continually seeks to improve the energy savings that LED lights provide by testing and incorporating new generations of lower wattage and more efficient bulbs as they become available. The technology has proven to provide improved lighting characteristics as well as energy efficiencies.

Day Lighting Technology

Starting in 2013 Roundy's has designed its stores with more windows than in the past in order to take advantage of day lighting technology. In 2013, two stores were built with a raised roof section to allow for ribbon windows on the interior to act as skylights. This strategy increases the ability to use natural light for maximum visual comfort and to reduce energy consumption. This has continued in 2014 with new Mariano's stores being built with glass atriums to provide natural light into the stores.

2014 Renewable Energy Initiatives

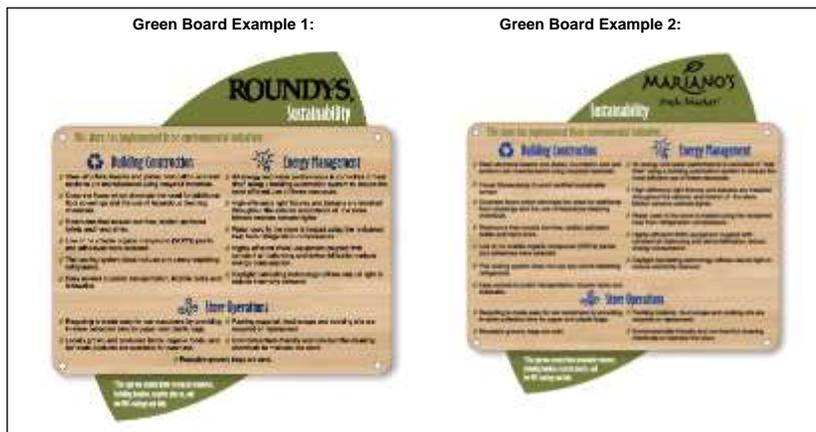
In 2014, Roundy's continued its participation in Wisconsin's Focus on Energy Incentive Program that involved the implementation of various cost-effective energy efficiency and renewable projects. According to Focus on Energy, the total energy savings from all Wisconsin projects Roundy's submitted to the program in 2014 was 1,437,493 kWh. This involved 20 projects at 11 locations ranging from new construction, commercial refrigeration, lighting and HVAC. Roundy's also implemented projects in its Illinois stores. These included the construction of 6 new stores, where according to Com Ed,

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this resulted in a savings of 2,180,143 kWh. The total saved in 2014 between ComEd and Focus on Energy was 3,617,636 kWh which equates to approximately 2,750 tons of (CO₂) averted.³ Roundy's continues to post in new and remodeled stores its signature "Green Boards" that detail the environmental/energy attributes associated with each store.

Green Board Example:



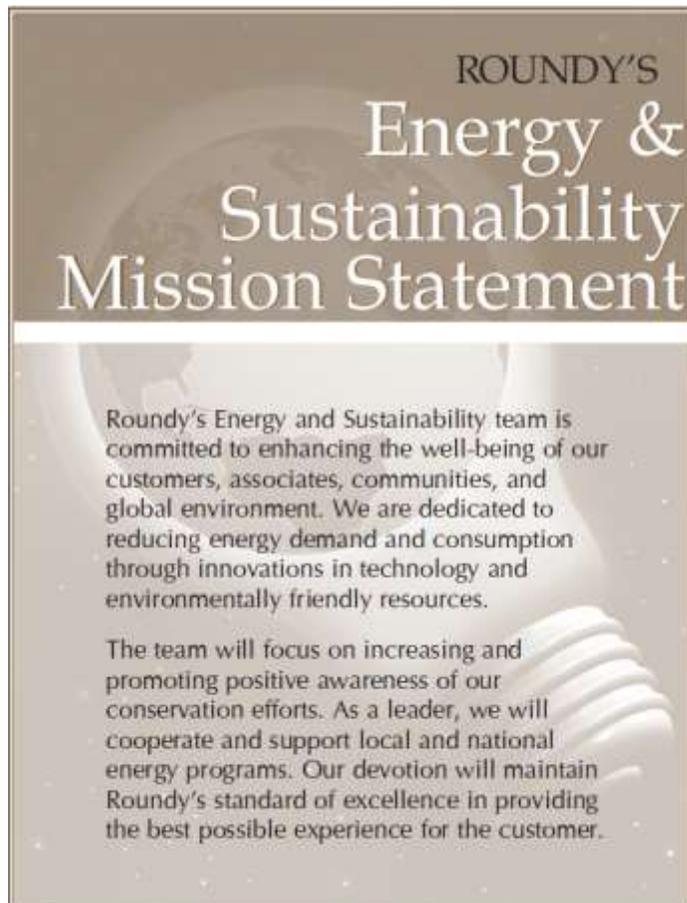
Another visible way Roundy's gets involved with green awareness is by continuing to offer reusable bags that cost \$1.00 each. Roundy's rewards customers who use reusable bags by providing them a five-cent store credit for each bag used.

Many of these initiatives are identified and implemented by Roundy's corporate full-time Energy Program Manager.

Energy & Sustainability Mission Statement

Roundy's has developed the following mission statement for its energy and sustainability efforts:

³ CO₂ was calculated using the United States Environmental Protection Agency Clean Energy Green House Gas Equivalencies Calculator at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>



3. Environmental Management System (EMS) Status

The Roundy's Oconomowoc Distribution Center environmental team initially developed and implemented its EMS in 2007. Pursuant to statute, an external audit of the EMS must be conducted every three years. Because an external audit was completed in 2012, 2014 was an internal audit year. Roundy's performed the internal audit with the goal of:

- Demonstrating that the Roundy's Oconomowoc Distribution Center's EMS is part of its business system that produces superior environmental performance, and
- Providing objective evidence that demonstrates continual improvement is incorporated into the foundation of the EMS.

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The findings of the internal audit confirmed the following:

- The EMS is in substantial conformance with Green Tier requirements.
- EMS is supported by top management.
- EMS achieves and re-establishes its environmental Objectives and Targets resulting in superior environmental performance.
- The EMS has been found to continue to be "Functionally Equivalent" to ISO 14001, to be producing superior environmental performance, and to have a foundation and operation that conforms to the continual improvement requirements of the Green Tier program.
- The audit found Roundy's to be compliant in all areas.
- As a result of the 2014 audit, the EMS will be amended for 2015. Roundy's added the new protocol of making sure all visitors to the Oconomowoc warehouse are made aware of environmental policies.

4. 2006 / 2010 Agreement

Roundy's participation in Green Tier dates back to December 22, 2006, when the Wisconsin Department of Natural Resources (WDNR) first accepted it into the program. In November, 2010, Roundy's re-confirmed its commitment to Green Tier. The updated commitment letter is attached at Appendix A. Information outlining Roundy's continual efforts to address its Green Tier measures at the Oconomowoc Distribution Center are outlined in the following section.

4.1 Minimize Energy Use

Roundy's 2013 Green Tier Annual Report detailed objectives and targets for 2014 relating to energy minimization. These are outlined below:

Goal: Installation of LED lighting throughout the warehouse in fall of 2014

Result: Roundy's replaced all of its existing metal halide lights in its ice cream and freezer storage house (over 140,000 square feet) with LED lighting. 352 400-watt metal halide fixtures were replaced with 264 175-watt LED fixtures. This project is detailed in the WPCA nomination paper outlined in Attachment E.

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Objectives and Targets for 2015

Objective: Reduce electricity and natural gas usage at Oconomowoc warehouse.

Target: Seeking a 2% to 3% reduction at the Oconomowoc warehouse of 2014 levels by tracking kW hours and Therms.

Objective: Explore use of fuel cell technology in forklift batteries using 900 amp hydrogen/lithium batteries.

Target: Test battery life versus current batteries. Evaluate cost of battery and its life versus standard batteries.

Objective: Potential test of solar energy

Target: If test is implemented, chart energy saving versus cost to implement. Calculate payback.

4.2 Waste Minimization

The Oconomowoc Distribution Center continues to work towards greater waste minimization. In 2012, a project was started that included the introduction of a project to convert food waste into compost throughout our network. In 2013 that project was expanded as Roundy's partnered with a third party firm and worked on a pilot project in 13 stores to convert produce into animal feed. More information is available in the WPCA nomination paper in Attachment E.

Roundy's continues, where feasible, to reuse select sturdy product containers for packing and shipping to and from the Oconomowoc Distribution Center. For example, the facility has fully converted to plastic pallets that are reused for all shipping occurring on the Roundy's fleet. Plastic flip sheets are also used as a stable base when stacking certain products on a pallet, replacing traditional cardboard sheets and, thus, further reducing cardboard usage.

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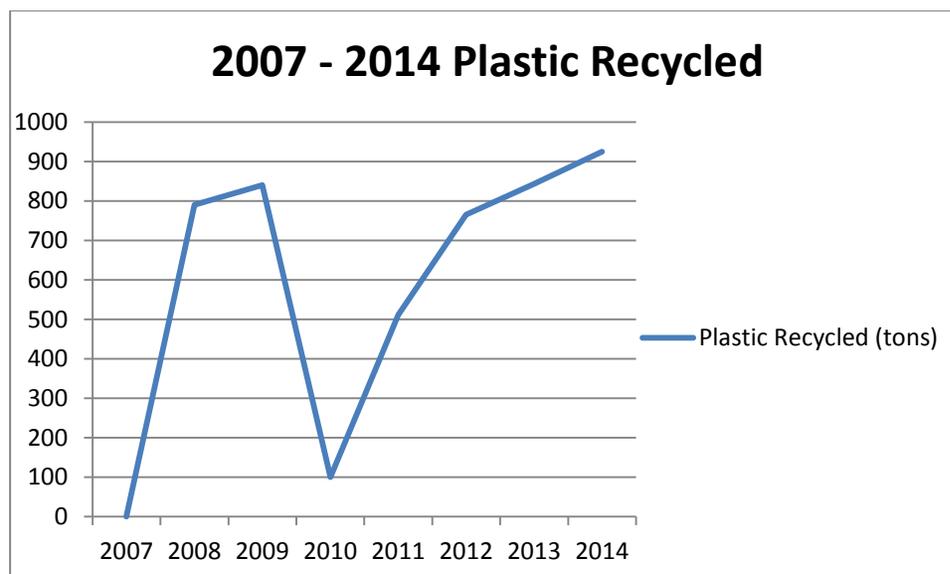
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Roundy's continues to maintain its program for recycling cardboard, scrap metal, and plastic. The Oconomowoc Distribution Center serves as an aggregation point for plastic, cardboard, and scrap metal for both this facility and the retail stores it services.

The Oconomowoc Distribution Center also continues to deice parking lots with sand instead of salt. The use of sand, however, requires more effort from the Oconomowoc Distribution Center as it must periodically sweep parking lots and the tractor yard during winter thaws. New sand is then applied during deteriorating weather conditions. The Oconomowoc Distribution Center continues to use a contractor to periodically remove used sand mixed with snow back to the contractor's operation where the sand is filtered and washed for reuse. In 2014, this practice resulted in approximately 125 tons of used sand being reclaimed.

4.2.1 2014 Plastic Recycling

Plastic is widely used at many distribution centers and grocery retailers to wrap pallets and cases prior to shipment. Product received from suppliers is often plastic wrapped and plastic is removed at the Oconomowoc Distribution Center to break apart the delivery and stage it for smaller shipments to individual Roundy's stores. In addition to this plastic wrap, the Oconomowoc Distribution Center currently includes in its recycling program bags, bubble wrap, and plastic pallet corner guards.



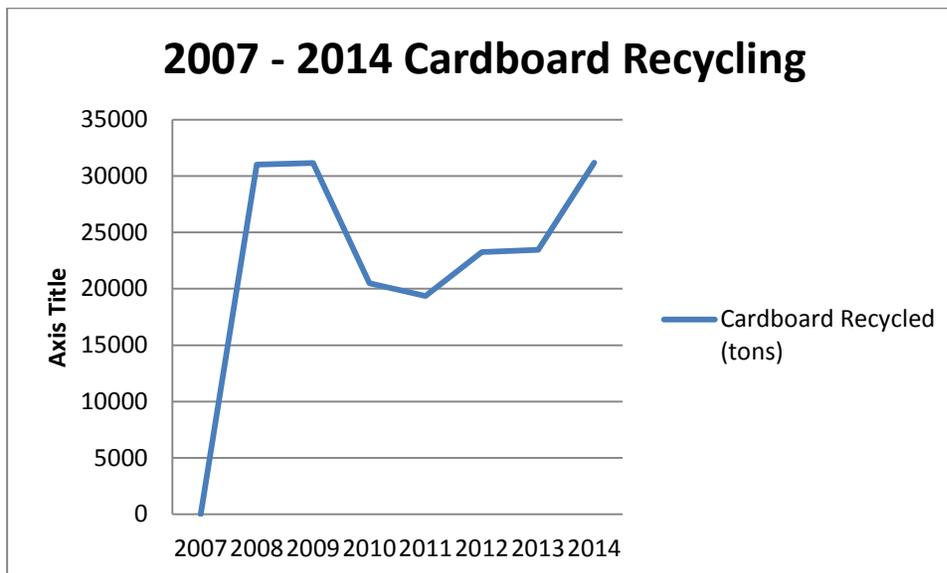
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In 2014, plastic recycling at the Oconomowoc Distribution Center totaled 925 tons, up from 843 tons in 2013. The increase in the amount of plastic recycled since 2010 is likely due to factors such as an increase in volume due to additional Mariano's stores, increased use of plastic by manufacturers, the amount of plastic needed to wrap shipments to stores, and the increased recycling of plastic corner guards (initiated in 2011). The Oconomowoc Distribution Center continues to look for more sources for recycling and continues to track conformance with its internal recycling program through formal and informal source segregation inspections and observations. Additionally, company representatives undergo awareness training and the program provides continued diligence through supervisor monitoring for adherence to the recycling program.

4.2.2 2014 Cardboard Recycling

In 2014, a total of 31,187 tons of cardboard were recycled, which represents an increase over 2013 levels. This increase was likely related to increased volumes due to the new Mariano's stores.



The Oconomowoc Distribution Center continues to look for more sources for recycling and continues to track internal conformance through formal and informal source segregation inspections and observations. Additionally, company representatives have awareness training and continued diligence through supervisor monitoring for

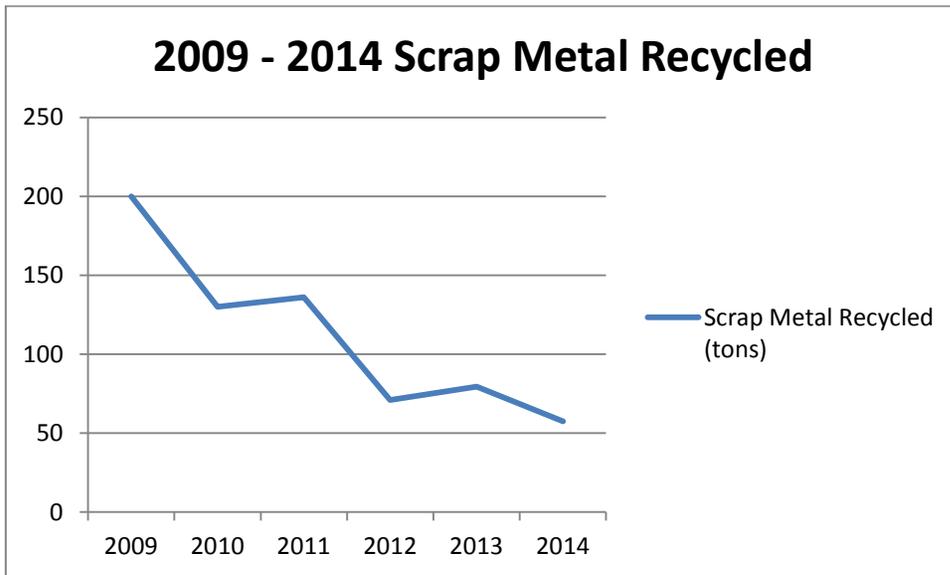
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adherence to the recycling program. All of these activities will help promote cardboard recycling.

4.2.3 2014 Metal Recycling

In 2014 approximately 58 tons of scrap metal were recycled from the Oconomowoc Distribution Center. This volume includes scrap metal collected from the retail stores that is accumulated at the Oconomowoc Distribution Center.



Roundy's 2013 Green Tier Annual Report detailed objectives and targets for 2014 relating to waste minimization. These are outlined below:

Goal: Experimenting with a paperless environment in the office.

Result: The following processes are now paperless:

Wage Recovery

Fish Temperature Logs

Produce Logs

The Oconomowoc warehouse now requires 2-sided printing for all internal documents which results in a saving of a full pallet of paper for a total cost savings of \$1,200.00

Objectives and Targets for 2015

Objective: Reduce volume sent to landfills.

Target: Increase recycle of cardboard and plastic by 2% to 3% over 2014 levels.

Objective: Continue evaluation of Compost program which started in 2013 and expanded to 28 stores in 2014 (as noted in Section 4.2, page 8).

Target: Perform cost benefit analysis to see if it can be rolled out to more stores.

4.3 Evaluate Vendor Technologies

Per its Green Tier commitment, Roundy's also continually evaluates whether new technological and operational equipment processes and/or devices might present an actual benefit to reducing mobile emissions and improved fuel economy. The information presented concerning estimated emission reductions associated with Roundy's transportation efforts in this section are all calculated based upon estimated vehicle miles traveled associated with the Oconomowoc Distribution Center.⁴ This section of the report will also, however, outline information on transportation requested by DNR's Green Tier Annual Report Guidance dated July 23, 2013.

⁴ Due to the closing of the Stevens Point Distribution Center, which resulted in changes in the composition of the Oconomowoc Distribution Center fleet over the course of 2014, WDNR's 2014 calculations use estimated vehicle miles traveled, instead of documented vehicle miles traveled per truck within the fleet. WDNR derived estimated vehicle miles traveled based upon the monthly fuel consumption at the Oconomowoc Distribution Center multiplied by the 2013 ODC average fleet fuel efficiency of 7.43 miles per gallon (calculated from last year's reported information). WDNR estimated the total vehicle miles traveled associated with the Oconomowoc Distribution Center fleet for 2014 to be 4,137,618 miles.

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Because of the closing of the Stevens Point facility in 2014, some trucks that were formerly part of the Oconomowoc Distribution Center fleet were sold during 2014 while some trucks that were part of the Stevens Point fleet were transferred to Oconomowoc. At the end of 2014, the Oconomowoc fleet consisted of (0) MY 2003, (27) MY 2005, (22) MY 2007, (9) MY 2008 and (1) CNG.

CNG

On June 26, 2013 Roundy's began a pilot project utilizing an alternate fuel tractor to determine if a 12 Liter compressed natural gas ("CNG") engine would perform consistent with its current business model and needs. A MY 2013 tractor with a 12 Liter CNG engine was leased from June 26 to July 14, 2013, with the purpose of tracking natural gas fuel consumption and engine performance delivering actual loads to Roundy's grocery stores. The test demonstrated that the tractor had enough torque and horsepower to suit Roundy's application without concern. The test also provided enough preliminary fuel cost savings to justify the purchase of one new 12 Liter CNG powered tractor in 2014.

For purposes of this 2014 Annual Report, WDNR calculated the potential estimated emission reductions associated with replacing a heavy duty diesel tractor with a tractor using CNG technology. Because the information readily available at this time to the WDNR within the EPA Diesel Emissions Quantifier only provides emission information associated with CNG fuel in general, and does not provide emission information associated with different sizes of CNG engines, the WDNR's calculated estimated emission reductions cannot be deemed to be representative of actual emission reductions at Roundy's ODC, nor of actual emission reductions. Thus, any potential estimated calculated emission reductions provided in this report can only be used for informational purposes. Estimated, actual emission reductions that may be associated with replacing an existing diesel tractor within Roundy's fleet with one using CNG technology will require more precise calculations that factor in the model year of the diesel tractor that is replaced, emissions information concerning the precise CNG engine purchased and corresponding information pertaining to vehicle miles traveled and amount of fuel use.

For purposes of WDNR's calculations, WDNR calculated the potential emissions associated with a MY 2014 HD Diesel Truck traveling 16,431 miles using the MOVES 2014 model⁵ and the emissions associated with a MY 2015 CNG Truck based upon the use of 2,930 CNG equivalent gallons traveling 16,431 miles using EPA's Diesel Emissions Quantifier. The difference between the emissions calculated using a MY 2014 diesel tractor, and the emissions calculated using a MY 2015 CNG

⁵ The CNG truck was purchased in 2014 and was not part of the ODC fleet for the entire year. This truck was documented as having traveled 16,431 miles during 2014.

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Truck, comprises the potential emission reductions associated with replacing a MY 2014 diesel tractor with a MY 2015 CNG truck.

WDNR's calculations reflect a potential estimated emission reductions associated with the use of CNG technology as follows:⁶

422 pounds of NOx
19 pounds of PM 2.5
47 pounds of VOC
105 pounds of CO
60,789 pounds of CO₂

4.4 Transportation

Roundy's 2013 Green Tier Annual Report detailed objectives and targets for 2014 relating to transportation. These are outlined below:

Goal: Evaluating electric refrigeration units and natural gas spotter units and tractors including a live test of a CNG tractor in the delivery of product to the Milwaukee stores. This will continue in 2014 with the purchase of a CNG tractor.

Result: The CNG tractor was purchased in August of 2014 and evaluation is ongoing.

⁶ Additional information concerning WDNR's emission calculations can be found in Appendix B. At the time of Roundy's Partners for Clean Air Award Nomination submittal, WDNR had not yet developed its modeling protocol for Roundy's 2014 transportation efforts. Thus, for purposes of the nomination submittal, WDNR estimated emission reductions from the replacement of a MY 2006 HD Diesel Truck (representative of the national average model year of diesel truck currently on the road, with a MY 2015 CNG Fuel Truck using 2930 CNG equivalent gallons.

4.4.1 Super Single Tires

Super Single Tires (referred to as single wide tires by the United States Environmental Protection Agency Smart Way Program) are intended to provide low rolling resistance – in other words, the tires are intended to reduce the drag from the weight of the tires on the road and thereby improve fuel efficiency.

For purposes of the 2014 report, WDNR estimated the potential yearly emission reductions associated with the Oconomowoc Distribution Center fleet's use of super single tires by assuming that super single tires had been used on all fleet tractors for all of 2014 and using EPA estimates that super single tires improve fuel efficiency by at least 3%. Using the 2013 ODC average fleet fuel efficiency of 7.43 miles per gallon with super single tires and a fleet average of 7.21 miles per gallon without super single tires, the installation of super single tires on a fleet traveling an estimated 4,137,618 miles could potentially result in a reduction of 187 tons of CO₂. See Appendix B for the WDNR emission calculations.

4.4.2 Trailer Skirts

Trailer skirts are designed to reduce aerodynamic drag. Like the Super Single Tires, EPA's Smart Way program considers aerodynamic trailer skirting to be a verified technology category to reduce aerodynamic drag. Due to Roundy's extensive corporate -wide initiative to install skirts on trailers, WDNR assumed that all Oconomowoc Distribution Center vehicle miles traveled in 2014 involved trailers with skirts. WDNR in its emission calculation communication indicated that EPA estimates that aerodynamic trailer skirts improve fuel efficiency by at least 4% and that emission calculations from scientific studies show that aerodynamic trailer skirts are estimated to improve fuel efficiency from 5-7%. For purposes of this report, WDNR assumed a 5% fuel efficiency from use of skirts.

Results of WDNR's calculations show an estimated potential yearly reduction of 317 tons of CO₂, assuming all vehicle miles the Oconomowoc Distribution Center fleet traveled over the calendar year included the use of trailers with skirts. Appendix B contains the WDNR calculations.

4.4.3 Use of Diesel Oxidation Catalysts (DOCs)

According to the U.S. Environmental Protection Agency's Diesel Emissions Quantifier, the DOCs are assumed to annually reduce VOC's by 50 percent, CO by 30 percent,

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NOx by 0%, and PM2.5 by 20 percent. Due to the variability of the model years that comprised the Oconomowoc Distribution Center fleet in 2014, and the fact that both MY 2003 trucks that were retrofitted with DOCs were sold in 2014, WDNR allocated 88,798 miles traveled to the use of DOCs at the Oconomowoc Distribution Center for 2014. Based upon the allocated miles traveled, WDNR calculated estimated emission reductions associated with the use of DOCs at the Oconomowoc Distribution Center fleet of 31 pounds of PM 2.5, 242 pounds of CO and 169 pounds of VOC due to the use of DOCs on the two 2003 model year tractors for part of the year. See Appendix B for WDNR emission calculations.

4.4.4 Idling Provisions

Roundy's prohibits all tractor-trailer trucks from idling on the premises. The only exceptions are when the temperature is above 90 or below 10 degrees Fahrenheit (see Appendix C). A short warm up may occur to prevent diesel fuel from gelling and engine startup difficulties. A copy of the Driver/Unloader Responsibilities handout containing Roundy's Oconomowoc Distribution Center idling policy is provided in writing to third-party vendors that deliver to the facility.

WDNR calculated estimated emission reductions associated with the Oconomowoc Distribution Center idling policy in accordance with the following assumptions:

1. Based upon 974 actual truck deliveries over a 7-day period in November, 2014, there is assumed to be an average of 139 truck trips per day to the Oconomowoc Distribution Center.
2. Based upon data from that 7-day period, each truck was on site for an average of approximately 3.9 hours; however, 0.4 hours has been deducted for maneuvering and it is assumed that a driver would not physically be in a tractor for 57 minutes for each trip.
3. Using these assumptions, emissions from idling could be reduced by approximately 2.55 hours per truck per day.
4. The Oconomowoc Distribution Center operated 350 days in 2014.
5. Using assumptions for Waukesha County Average MOVES 2014 Emission Factors for Heavy Duty Diesel Trucks, the estimated emission reductions from implementation of Roundy's idling policy in 2014 are as follows:

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11.92 tons of CO

32 tons of NOx

6.5 tons of VOC

1,225 tons of CO₂

0.46 tons of PM2.5

See Appendix B for WDNR emission calculations.

Going forward, the Oconomowoc Distribution Center will continue to restrict idling through a combination of measures. These include training Roundy's fleet drivers on anti-idling requirements and audits of compliance with the idling policy. Audits for compliance with the idling policy are included in the Oconomowoc Distribution Center internal audits that are conducted throughout the year. Transportation management staff conducts periodic, unannounced yard walks to confirm compliance with the policy. Finally, if a complaint is filed, then transportation management will respond appropriately.

4.4.5 Speed Controls

Roundy's utilizes speed controls such that when the tractor is in operation, the engine computer reduces the fuel when the driver reaches 62 miles per hour (mph).

WDNR's evaluation of the potential impact this initiative can have in reducing air emissions is based upon the estimated total vehicle miles traveled in 2014, includes an assumption that approximately 70 percent of travel is on highways and interstate roads and that speed controls are active on all of the tractors. WDNR calculated expected emissions at 65 mph and then at 62 mph – the difference between the two speeds comprises the estimated differences in emissions from use of the speed controls. WDNR estimated a total of 1,435 pounds of NOx reduced, 26 pounds of PM 2.5 reduced, 108 pounds of VOC increased, 454 pounds of CO increased, and 233 tons of CO₂ reduced as a result of the use of speed controls. More information concerning WDNR's emission calculations is presented in Appendix B.

4.4.6 Ride Share Program

In 2007, the Oconomowoc Distribution Center established a carpool program. At the program onset, the Center issued five carpool permits. The permit allows the designated carpool driver to park in a preferred parking spot that is nearest to an employee building entrance. In 2014, 53⁷ employees participated and/or were enrolled in the program.

WDNR calculated estimated emission reductions from the rideshare program based upon a 2011 Southeastern Wisconsin Regional Planning Commission (SEWRPC) travel survey indicating that the average roundtrip commute in the southeast Wisconsin seven-county region to and from work is 22 miles. WDNR also considered information on transportation research that quantifies potential benefits from rideshare programs. WDNR assumed 10 percent participation for its calculation of potential emission reductions for the Oconomowoc Distribution Center. Using 5.3 (10 percent X 53 employees) multiplied by 22 miles round trip would result in approximately 116.6 average miles. Assuming that a participating employee commutes to work an average of 230 days per year, in 2014 this could have resulted in a reduction of approximately 26,818 miles. Using emission factors for passenger vehicles, WDNR calculated estimated annual emission reductions of: 33 pounds of NO_x, 18 pounds of VOC, 250 pounds of CO, 1.1 pounds of PM 2.5 and 25,046 pounds of CO₂. See Appendix B for WDNR's emission calculations.

In addition to the carpool program, the Oconomowoc Distribution Center offers preferred employee parking for motorcycle riders.

4.5 Stakeholder Education

The Green Tier agreement and energy program at the Oconomowoc Distribution Center have resulted in energy conscious programs for new projects at existing stores and for new construction. The company continues to promote ideas and conversations on energy conservation and waste minimization, not just at the Oconomowoc

⁷ This number is the result of an audit of the program in 2014 to make sure all those currently listed as having ride share permits are currently employed by Roundy's at the Oconomowoc Distribution Center.

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Distribution Center, but with internal stakeholders, our retail stores, and at the corporate headquarters building as described in Section 2.

Roundy's continues to utilize the Employee Environmental Continual Improvement suggestion program implemented in mid-2007 to record and respond to suggestions and comments from employees. All suggestions and feedback are logged into the Environmental Continual Action Database. Once logged, each idea, concern or question is evaluated at Management Review meetings for implementation or response.

The Oconomowoc Distribution Center has the opportunity to make contact with hundreds of drivers daily as they deliver goods to the Oconomowoc Distribution Center. Each driver receives a copy of the Driver/Unloader Responsibilities handout documenting the Oconomowoc Distribution Center's idling policy, and information about Roundy's Environmental Policy attached at Appendix C. Roundy's idle policy is further discussed in Section 4.5.4 of this report.

Roundy's 2013 Green Tier Annual Report detailed objectives and targets for 2014 relating to stakeholder education. These are outlined below:

Goal: Continuing promotion of employee suggestion program and stakeholder involvement through the City of Oconomowoc, Oconomowoc Area Chamber of Commerce Green Strategy and ride share program.

Result: These efforts continued in 2014.

Goal: Continued collaboration with the Oconomowoc Area Chamber of Commerce, the Oconomowoc School District, and the WDNR on a long-term program to protect and support Rosenow Creek.

Result: These efforts continued in 2014

Objectives and Targets for 2015

Objective: Educate employees on EMS, conservation and waste reduction

Target: Management will cover topics relating to each of these subjects in quarterly EMS meetings.

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Objective: Educate store personnel on EMS, conservation, and waste reduction

Target: Give one tour a quarter of the Oconomowoc Distribution Center to store personnel.

Objective: Educate other businesses regarding Green Tier and benefits of EMS.

Target: Conduct two educational speeches or meetings per year to outside parties.

4.6 Continued Community Efforts

4.6.1 Oconomowoc Distribution Center Efforts

The Oconomowoc Distribution Center continues its alliance with the Oconomowoc Area Chamber of Commerce. In 2010, Roundy's spearheaded an effort to create a Green Business Initiative Committee. The mission of the Committee is "to protect the environment by reducing waste, saving energy and eliminating pollution." According to the Committee:

It is our obligation to explore and implement environmentally sound business practices that reduce waste, save energy and prevent pollution. A cleaner environmental footprint will benefit our community, our businesses and set an example for others to help guarantee a healthy environment for future generations. The Oconomowoc Area Chamber of Commerce is committed to partnering with its member businesses, and the community-at-large, to achieve these goals.⁸

In 2014, Roundy's continued its involvement with the Green Business Initiative Committee. As an active member of the Green Business Initiative Committee, Roundy's also participates in key projects including Adopt a Highway, tree plantings, and energy seminars. In 2011, the Oconomowoc Distribution Center began collaboration with the Oconomowoc Area Chamber of Commerce, the Oconomowoc School District, and the WDNR on a long term program to protect and support Rosenow Creek, a Class A Trout Stream located within the Oconomowoc School District property.

⁸ <http://www.oconomowoc.org/green-business.php>

2014 Green Tier Annual Report

Roundy's Oconomowoc
Distribution Center
Oconomowoc, Wisconsin

4.6.2 About Roundy's Foundation

Chartered in August 2003, the Roundy's Foundation was created to further strengthen the commitment between Roundy's Supermarkets, Inc. and the communities it serves. Roundy's Pick 'n Save, Copps and Metro Market stores are found throughout Wisconsin and Mariano's stores serve Illinois. The Roundy's Foundation is dedicated to hunger relief and families in crisis due to domestic abuse. Since its inception, it has given close to \$10 million to organizations focused on community service in those areas of need. Major grant recipients include food banks and women and family violence shelters throughout Wisconsin and Illinois.

4.6.3 Roundy's Foundation Focused on Feeding Families Tours

In 2014 Roundy's donated more than \$981,000 to various organizations. 70 grants were issued in addition to 120 food pantries that receiving gifts through the spring and Fall Focused on Feeding Families food tours.

83% went to Hunger Relief programs

17% went to Domestic Abuse programs

The Roundy's Focused on Feeding Families tours involved a total of 120 food pantries that were provided donations, 60 in both the spring and fall. To achieve these goals, the Roundy's Foundation truck stops at pre-selected stores throughout Wisconsin and Illinois. The pantries selected in each community come to the store with their vehicles and store volunteers help unload food from the Roundy's Foundation truck and distribute the donated items into pantry vehicles. Additionally, many stores choose to host food drives to allow customers to add to the Roundy's Foundation donation being given to each pantry during the tours.

Outside of the *Focused on Feeding Families* tours, the Roundy's Foundation Board of Directors meets every other month to consider grants.

5 Annual Report Environmental Performance

WDNR requested information on certain environmental elements from the Roundy's Supermarkets Inc., Oconomowoc Distribution Center as part of its annual report. Applicable information is either presented below or a reference is provided to where it is placed in other sections of this report.

5.1 Energy and Climate Change

The Oconomowoc Distribution Center was constructed with numerous energy conservation measures that have either been sustained or further improved. These include energy efficient lighting utilizing motion sensors, natural daylight, and sufficient insulation to provide cooling of non-freezer portions of the building during the normal summer season.

5.2 Supply Chain

The company continues to communicate with its customers and vendors on the value of reusable pallets and plastic flip sheets and routinely uses these for shipments on Roundy's fleet. While the company cannot directly influence how manufacturers package their product for distribution, it must contend with the result from improper packaging from broken containers and boxes. Roundy's routinely communicates its experiences with vendors and/or manufacturers and salvages retail ready products from these deliveries.

5.3 Stakeholder Involvement

As described in Section 4.4 Roundy's has engaged in internal and external stakeholder coordination. Involvement with employees, suppliers, and customers is documented through:

- Employee Suggestion Program
- Employee Training and Awareness
- Coordination with External Stakeholders, Drivers, Suppliers, and Vendors
- Participation in the Community through organizations such as the Oconomowoc Area Chamber of Commerce, and implementation of energy conservation programs at their stores

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Oconomowoc, Wisconsin

6 Annual Metrics Reporting

Metrics requested by WDNR are contained in the Wisconsin WDNR Green Tier Sustainability Metrics spreadsheet contained in Appendix D.

7 Closing

Roundy's Supermarkets Inc., is pleased to be a Tier 1 participant in Wisconsin's forward thinking Green Tier program. The program goals and objectives match the Company's thinking with regard to environmental stewardship and waste minimization.

Appendix A

WDNR Amended 2015 Green Tier
Acceptance Letter for Tier 1

Appendix B

WDNR Air Management Emission
Reduction Calculations

Appendix C

Roundy's Driver/Unloader
Responsibilities Oconomowoc
Distribution Center

Appendix D

WDNR Green Tier Sustainability
Metrics Spreadsheet

Appendix E

Wisconsin Partners for Clean Air
Nomination Paper

Appendix A

WDNR Amended 2015 Green Tier
Acceptance Letter for Tier 1



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

December 22, 2006

Mike Schmitt
Roundy's Supermarkets, Inc
PO Box 473
Milwaukee, WI 53201

UPDATE: Current contact is Dan Farrell.

Subject: Green Tier Acceptance Letter for Tier 1

Dear Mr. Schmitt:

Thank you for completing an application for a Tier 1 agreement. The Department of Natural Resources (DNR) is pleased to approve your application and accept you into the Green Tier program. This letter of acceptance covers the Roundy's Supermarkets Inc. Oconomowoc Distribution Center, Oconomowoc, Wisconsin. This letter of acceptance is authorized by The Environmental Results Program Act, § 299.83, Wis. Stats., created by 2003 Wisconsin Act 276 (effective on May 1, 2004), which is commonly called the "Green Tier Law."

This letter recognizes that Roundy's has already satisfied one of its Green Tier commitments by voluntarily retrofitting more than one quarter of its Class 8 truck fleet with diesel oxidation catalysts (DOC). 32 Fleetguard DOCs were installed as direct replacements to the existing exhaust system on its 2001-2004 model year tractors. The DOCs are designed to reduce the emissions of certain air pollutants contained in diesel exhaust. As you will recall, this commitment was identified in your Indirect Source permit issued on May 18, 2004. Roundy's participation in the Green Tier program reflects your continuing commitment to superior environmental performance and continuous improvement. If future circumstances necessitate stepping back from this commitment, please notify us.

In addition to the DOC upgrade mentioned above, you have also agreed to the following examples of superior environmental performance:

- a) Continue to implement energy use minimization ideas, including occupancy sensors, daylighting, and use of high efficiency replacement bulbs and ballasts.
- b) Minimize waste cardboard and packaging waste from the distribution facility
- c) Evaluate whether certain technological and operational equipment, processes, and/or devices present an actual benefit to reducing mobile emissions and improved fuel economy. The scope of this evaluation will be developed and implemented on an ongoing basis with Mike Friedlander. Roundy's will commit to sharing this information with the DNR in a mutually agreed format.
- d) Educate stakeholders about the benefits of daylighting and green design

With this letter, you are encouraged to use the Green Tier Program logo on written materials that are related to your facilities. Attached to this Acceptance Letter is a unique certificate that recognizes you for participating in the Green Tier Program. The DNR will work with you to

annually celebrate your participation in the Green Tier program through a joint press release to local newspapers and will maintain your company's name on a list of participants that is available on the DNR's website.

As a participant in the Green Tier program, you are entitled to Deferred Civil Enforcement, as described in §299.83(6m)(d). In brief this means that if you discover either a non-conformance in your EMS, or you discover a violation with an existing environmental requirement, and if you provide us notice of your discovery along with a corrective action plan that conforms to the requirements in the statute, and if you successfully and timely implement the corrective action plan, we will not seek to impose penalties on Roundy's for the non-conformance or violation. You are reminded that nothing in this acceptance letter replaces any obligation that you have to report on, and correct, any violations of law or regulation.

If you choose not to certify your EMS under ISO 14000, please document that your EMS is functionally equivalent to an ISO 14000 EMS by following the guidance attached. As you know, Roundy's needs to have in place within one year of this letter an EMS that either is demonstrated to be functionally equivalent to an ISO 14001 EMS, or is certified to ISO 14001. As a reminder, you also need to have audited your EMS by the end of the first year of this agreement.

UPDATE: Annual report due date is now August 1.

You are also asked to update the DNR annually, beginning in March, 2008, on your consultation with interested persons in the area. You are also asked to update the DNR annually on your progress in meeting your objectives and targets and implementing your EMS. Both of these requirements can be incorporated into your annual report to the DNR on your environmental performance accomplishments, and any EMS non-conformances or violations. Please also provide the DNR with documentation of your management review of your environmental management system at that time.

We would encourage you, as part of your annual report, to prepare an executive summary of your accomplishments over the last year that can be placed on the DNR's web site, and which could also be posted on Roundy's web site.

As a reminder, by the third year of your participation in the Green Tier program you must have your EMS audited by an outside environmental auditor. The results of this audit should also be reported to the DNR.

Finally, if you have any questions about your interaction as a Tier 1 participant with the DNR, Mike Friedlander has been assigned as your single point of contact. Please coordinate with Mike on an annual meeting that will be used to brief the DNR on your environmental performance, and the progress made on the objectives and targets. This meeting may also be used to gather input on the objectives and targets to be set for the coming year.

Your acceptance into the Green Tier Program is good for 5 years, and your status as a Green Tier company can be extended as we mutually agree. You may withdraw from the program at any time by notifying us of your decision to withdraw. We may also withdraw you from the program if we believe that it is in the best interests of the Green Tier program to end the relationship that is created with this letter.

We want to welcome you as a Tier 1 company and encourage you to work toward Tier II status in the future.

Sincerely,



Scott Hassett, Secretary
WI Department of Natural Resources

As of November 18, 2010 the five year acceptance provision for Roundy's Supermarkets, Inc. has been lifted. Roundy's Supermarkets, Inc.'s acceptance into the Green Tier Program will extend indefinitely.

Attachment: Tier 1 Application
Certificate of Recognition
Environmental Results Program Logo
Functional Equivalency Guidance
Generic Suite of Green Tier Indicators

Appendix B

WDNR Air Management Emission
Reduction Calculations

WDNR Air Management Emission Reduction Calculations

Web Linked Reports

<http://www.epa.gov/smartway/forpartners/technology.htm>

<http://www.vtpi.org/tm/tm34.htm>

<http://cfpub.epa.gov/quantifier/index.cfm?action=fleet.edit>

The emission factors are provided in a separate Excel spreadsheet. I used a different format and different model (MOVES2014) than were used last year.

The Excel file has the following four tabs:

1. Commuting EF's for passenger cars and passenger trucks
2. Truck EF's for overall travel
3. Truck EF's for extended idling
4. Truck running EF's for speeds ranging from 60 mph to 70 mph

In all four cases, emissions factors are provided for five pollutants: NO_x, PM_{2.5}, VOC, CO and CO₂.

Also, in all four of these cases, weighted average emission factors are provided for the applicable fleet, either the commuting passenger vehicles or the Roundy's trucks at the Oconomowoc Distribution Center (ODC):

For passenger vehicles, the "applicable fleet" consists of all model years weighted by the best available travel fractions for the area, those for the seven-county vehicle inspection and maintenance program area in southeastern Wisconsin.

For the ODC diesel-powered trucks, determining the "applicable fleet" is complicated by a partial fleet changeover that occurred from June through September 2014. Therefore, three diesel truck fleets are defined:

The first fleet covers the first five months (January-May) and consists of the trucks operating from the ODC at the beginning of 2014.

The second fleet covers the next four months (June-September) – the changeover period. Since data are not available for the specific times of the truck changeovers, the number of trucks for each model year was estimated as the half-way point between the number at the beginning of 2014 and the number at the end of 2014. For example, for model year 2005, the ODC fleet had 34 trucks at the beginning of 2014 and 27 trucks at the end of 2014. Therefore, the estimated number of model year 2005 trucks during the four month changeover period is $(34 + 27)/2 = 30.5$.

The third fleet covers the final three months (October-December) and consists of the trucks operating from the ODC at the end of 2014.

For each month, the estimated vehicle miles travelled (VMT) are derived by monthly fuel consumption multiplied by Roundy's ODC 2013 average fuel efficiency (7.43 miles per gallon). For each month, the monthly VMT is allocated evenly to each truck in the fleet during the month. For example, during January through May, 34 of the 44 diesel trucks in the ODC fleet (77.3%) are of model year 2005. Therefore 77.3% of the VMT for each of the 5 months of January through May are allocated to model year 2005.

Combining the three diesel fleets results in a total annual VMT of 4,137,618, of which 88,798 miles are from model year 2003 trucks, 2,526,288 miles from model year 2005 trucks, 1,183,628 miles from model year 2007 trucks and 338,905 miles from model year 2008 trucks.

In addition, emissions from one Compressed Natural Gas (CNG) truck of model year 2014 (16,431 total annual miles) were calculated using the USEPA Diesel Emissions Quantifier.

For the commuting travel, I provided emission factors that are half-way between those for all processes (running, start, evaporative VOC and refueling VOC) and those for only running emissions. The reason why I excluded some of the estimated total emissions is that carpooling does not fully reduce emissions because of difficult-to-quantify factors such as:

1. Extra travel by the car pool vehicle to pick up passengers.
2. Extra travel by car pool passengers to a pick up point.
3. Some evaporative emissions occur even when a vehicle is not used.
4. Another family member may use the vehicle of the car pool passenger.

I should note that VOC and CO emissions go *down* with increased speed for the Roundy's fleet. However, NOx emissions go up more that VOC + CO go down, so the combined effect of those three pollutants is an increase as speed increases. PM_{2.5} and CO₂ also go up with increased speed.

The emission factors for the Roundy's fleet are generally higher than the emission factors provided for 2013. These emission factors changed largely because the MOVES2014 model was officially revised to account for better in-use vehicle information. The emission factors for the commuting vehicles are also generally higher, largely because of updated vehicle registration data that reflects that the average Wisconsin model year fleet distribution is older than originally estimated.

EMISSION REDUCTION CALCULATION FOR SPEED CONTROL PROGRAM

WDNR's evaluation of emission differences from this initiative is based on the estimated total vehicle miles traveled in 2014 and includes an assumption that approximately 70 percent of travel is on highways and interstate roads and that speed controls are active on all of the tractors. WDNR calculated expected emissions at 65 mph and then at 62 mph - the difference between the two speeds comprises the estimated differences in emissions from use of the speed controls.

Estimated TOTAL MILES = 4,137,618 X 70% Highway = 2,896,333

2,896,333 X 7.616 NOx grams per mile @ 62 mph = 22,058,472 of NOx grams / 454 = 48,587 pounds of NOx

2,896,333 X 7.841 NOx grams per mile @ 65 mph = 22,710,147 of NOx grams / 454 = 50,022 pounds of NOx

1435 pounds of NOx reduced

2,896,333 X 0.312 PM_{2.5} grams per mile @ 62 mph = 903,656 of PM_{2.5} grams / 454 = 1,990 pounds of PM_{2.5}

2,896,333 X 0.481 PM_{2.5} grams per mile @ 65 mph = 915,241 of PM_{2.5} grams / 454 = 2,016 pounds of PM_{2.5}

26 pounds of PM_{2.5} reduced

2,896,333 X 0.345 VOC grams per mile @ 62 mph = 999,235 of VOC grams / 454 = 2,201 pounds of VOC

2,896,333 X 0.328 VOC grams per mile @ 65 mph = 949,997 of VOC grams / 454 = 2,093 pounds of VOC

108 pounds of VOC increased

2,896,333 X 1.614 CO grams per mile @ 62 mph = 4,674,681 of CO grams / 454 = 10,297 pounds of CO

2,896,333 X 1.543 CO grams per mile @ 65 mph = 4,469,042 of CO grams / 454 = 9,843 pounds of CO

454 pounds of CO increased

2,896,333 X 1,630 CO₂ grams per mile @ 62 mph = 4,721,022,790 of CO₂ grams / 454 = 10,398,729 pounds of CO₂

2,896,333 X 1,703 CO₂ grams per mile @ 65 mph = 4,932,455,099 of CO₂ grams / 454 = 10,864,439 pounds of CO₂

465,710 pounds of CO₂ decreased

233 tons of CO₂ decreased

EMISSION REDUCTION CALCULATION FOR SUPER SINGLE TIRES PROGRAM

Super Single Tires are considered a "verifiable control technology" by the EPA Smart way program. As such, EPA estimates that super single tires improve fuel efficiency by at least 3%. For the purpose of the 2014 Annual Report, we assumed that all heavy duty diesel trucks operating at the Oconomowoc Distribution center were retrofitted with super single tires

Estimated TOTAL MILES = 4,137,618

TOTAL FUEL CONSUMPTION = 556,880

10,070 grams of CO₂ per gallon (22.2 pounds per gallon)

2013 ODC Average = 7.43 miles per gallon (mpg)

7.43 mpg / 1.03 = 7.21 mpg with no super single tires

7.43 - 7.21 = 0.22 super single fuel efficiency in mpg

4,137,618 / 7.21 mpg = 573,872 gallons
Fuel savings = 16,992 gallons
377,222 pounds of CO₂ reduced
187 tons of CO₂ reduced

EMISSION REDUCTION CALCULATION FOR AERODYNAMIC TRAILER SKIRTS PROGRAM

Aerodynamic trailer skirts are considered a "verifiable control technology" by the EPA Smart way program. As such, EPA estimates that Aerodynamic trailer skirts improve fuel efficiency by at least 4%. Based on scientific studies, aerodynamic trailer skirts are estimated to improve fuel efficiency from 5 -7%. For the purpose of the 2014 Annual Report, we assumed that all heavy duty diesel trailers operating at the Oconomowoc Distribution center were retrofitted with aerodynamic trailer skirts and applied the 5% efficiency improvement.

Estimated TOTAL MILES = 4,137,618
TOTAL FUEL CONSUMPTION = 556,880
10,070 grams of CO₂ per gallon (22.2 pounds per gallon)

2013 ODC Average = 7.43 miles per gallon
7.43 mpg / 1.05 = 7.08 mpg with no aerodynamic trailer skirts
7.43 - 7.08 = 0.35 aerodynamic trailer skirts efficiency in mpg
4,137,618 / 7.08 mpg = 585,409 gallons
Fuel savings = 28,529 gallons
633,344 pounds of CO₂ reduced
317 tons of CO₂ reduced per year

* CAVEAT - There may exist some unknown synergies between coupling super single tires and aerodynamic trailer skirts in these fuel efficiency calculations.

EMISSION REDUCTION CALCULATION FOR THE IDLE RESTRICTION PROGRAM

974 truck deliveries over a 7 day period in November, 139 truck trips per day
The average amount of time that each truck is "on site" is 3 hours 53 Minutes 35 seconds (3.9)
Assume trucks maneuver on site for 24 minutes per trip - no net reduction (0.4)
Assume truckers would leave cab for 57 minutes per trip - no net reduction (0.95)
Assume the idle restriction reduces idle emissions by 2.55 hours per truck per day
Assume Roundy's Fleet Average MOVES Emission Factors for Heavy Duty Diesel Trucks

EXTENDED IDLE EMISSION FACTORS FOR HEAVY DUTY DIESEL TRUCKS

NOx	232.7 grams per hour
PM _{2.5}	3.32 grams per hour
VOC	46.64 grams per hour
CO	87.0 grams per hour
CO ₂	9,007 grams per hour

139 X 2.55 = 355 hours of idling prevented each day

355 hours X 232.7 = 82,608 grams of NOx / 454 = 182 pounds of NOx

355 hours X 3.32 = 1179 grams of PM_{2.5} / 454 = 2.6 pounds of PM_{2.5}

355 hours X 46.64 = 16,557 grams of VOC / 454 = 37 pounds of VOC

355 hours X 87 = 30,885 grams of CO / 454 = 68 pounds of CO

355 hours X 9,007 grams CO₂ / 454 = 7,043 pounds of CO₂ / 2000 = 3.5 tons of CO₂

The Oconomowoc Distribution Center was in operation 350 days in 2014.

182 pounds of NO_x X 350 = 63,700 pounds / 2000 = **32 tons NO_x reduced per year**

2.6 pounds of PM_{2.5} X 350 = 910 pounds / 2000 = **0.46 ton PM_{2.5} reduced year**

37 pounds of VOC X 350 = 8,712 pounds / 2000 = **6.5 tons VOC reduced per year**

68 pounds of CO X 350 = 23,800 pounds / 2000 = **11.92 tons CO reduced per year**

3.5 tons X 350 = **1,225 tons of CO₂ reduced per year**

EMISSION REDUCTION CALCULATION FOR ROUNDY'S RIDESHARE PROGRAM

The emission factors for passenger vehicles cover all model years and are based on the Southeastern Wisconsin age distribution. The emission factors vary widely based on model year and vehicle type (passenger car or passenger truck)

My metric for rideshare as follows:

2011 SEWRPC travel survey reveals that average home based work trip is 22 miles (11 X2). Rideshare programs have the potential to reduce vehicle miles traveled (VMT) between 5-15% if information is only provided, 10-30% if parking cash out is provided. I used the 10% as the assumption. 53 people at the Roundy's Oconomowoc Distribution Center are enrolled in the rideshare program. $53 * 0.10 = 5.3 * 22 = 116.6$. Assuming an enrolled employee commutes to work 230 days per year on average, the miles reduced annually is: $116.6 * 230 = 26,818$

EMISSION FACTORS FOR PASSENGER VEHICLES

NO_x 0.553 grams per mile

PM_{2.5} 0.018 grams per mile

VOC 0.301 grams per mile

CO 4.227 grams per mile

CO₂ 424 grams per mile

$26,818 * 0.553 =$ grams NO_x reduced annually / 454 = **33 pounds NO_x reduced per year**

$26,818 * 0.018 =$ grams PM_{2.5} reduced annually / 454 = **1.1 pounds PM_{2.5} reduced per year**

$26,818 * 0.301 =$ grams VOC reduced annually / 454 = **18 pounds VOC reduced per year**

$26,818 * 4.227 =$ grams CO reduced annually / 454 = **250 pounds CO reduced per year**

$26,818 * 424 =$ grams CO₂ reduced annually / 454 = **25,046 pounds CO₂ reduced per year**

DIESEL OXIDATION CATALYST (DOC) EMISSION REDUCTION CALCULATION

All emission factors are annual average emission factors

**EMISSION FACTORS FOR LONG HAUL TRUCKS
(WITHOUT DOC'S FOR MY (2003))**

NOx	13.663 grams per mile
PM _{2.5}	0.781 grams per mile
VOC	1.729 grams per mile
CO	4.126 grams per mile

Estimated Total miles for HDDV w DOC = 88,799

As provided by USEPA's Diesel Emissions Quantifier, the DOC's are assumed to reduce VOC's by 50%, NOx by 0% and CO by 30% and PM_{2.5} by 20%
All emission factors are annual average emission factors

88,799 * 13.663 = 1,213,261 grams of NOx per year for uncontrolled HDDV
88,799 * 0.781 = 69,352 grams of PM_{2.5} per year for uncontrolled HDDV
88,799 * 1.729 = 153,534 grams of VOC per year for uncontrolled HDDV
88,799 * 4.126 = 366,385 grams of CO per year for uncontrolled HDDV

69,352 grams of PM_{2.5} * 0.2 = 13,870 / 454 = **31 pounds of PM_{2.5} reduced per year**
153,534 grams of VOC * 0.5 = 76,767 grams / 454 = **169 pounds of VOC reduced per year**
366,385 grams of CO * 0.3 = 109,916 grams / 454 = **242 pounds of CO reduced per year**

COMPRESSED NATURAL GAS (CNG) POTENTIAL EMISSION REDUCTION CALCULATION AS COMPARED TO DIESEL TRUCKS

For purposes of WDNR's calculations, WDNR first calculated the potential emissions associated with a MY 2014 HD Diesel Truck travelling 16,431. Potential emissions were based upon emission factors within the MOVES 2014 model.

12.312 g/mile NOx * 16,431 miles travelled = 202,928 / 454 = 446 pounds NOx
0.515 g/mile PM_{2.5} * 16,431 miles travelled = 8,462 / 454 = 19 pounds PM_{2.5}
1.291 g/mile VOC * 16,431 miles travelled = 21,212 / 454 = 47 pounds VOC
3.337 g/mile CO * 16,431 miles travelled = 54,830 / 454 = 121 pounds CO
1,967 g/mile CO₂ * 16,431 miles travelled = 32,319,777 / 454 = 71,189 pounds (36 tons) CO₂

Next, using EPA's Diesel Emissions Quantifier, WDNR then calculated the emissions associated with a MY 2015 HD CNG Truck based upon 16,431 miles travelled and 2930 CNG equivalent gallons.

0.012 Short tons of NOx or 24 pounds of NOx
0.0000 Short tons of PM_{2.5} or 0.0 pounds of PM_{2.5}
0.0001 Short tons of VOC or 0.2 pounds of VOC
0.008 Short tons of CO or 16 pounds of CO
5.2 Short tons of CO₂ or 10,400 pounds of CO₂

The difference between emissions calculated using MY 2014 HD Diesel Truck travelling 16,431 miles pursuant to MOVES 2014 and the emissions calculated using MY 2015 HD CNG Truck using 2930 equivalent gallons pursuant to EPA's Diesel Emissions Quantifier comprises the potential emission reductions associated with replacing a MY 2014 HD Diesel Truck with a MY 2015 HD CNG Truck.

WDNR's calculations reflect a potential estimated emission reductions associated with the use of CNG technology as follows:

422 pounds of NO_x
19 pounds of PM_{2.5}
47 pounds of VOC
105 pounds of CO
30 short tons or 60,789 pounds of CO₂

Appendix C

**Roundy's Driver/Unloader
Responsibilities Oconomowoc
Distribution Center**

ROUNDY'S SUPERMARKETS, INC.
PICK 'N SAVE • COPPS • RAINBOW FOODS

DRIVER / UNLOADER RESPONSIBILITIES
OCONOMOWOC DISTRIBUTION CENTER

The Roundy's Oconomowoc Distribution Center is a proud participant in the Wisconsin Department of Natural Resources Green Tier program for Environmental Excellence.

Our Environmental Policy is:

Roundy's is committed to managing our products and processes in an environmentally responsible manner by complying with requirements, by preventing pollution, and by improving continually.

- ❖ We will do this through:
- ❖ Top management commitment;
- ❖ Reducing our impact on the environment through pollution prevention;
- ❖ Understanding and complying with environmental requirements;
- ❖ Continuous measurement and improvement of our environmental performance;
- ❖ Setting and achieving environmental goals, objectives and targets.



- This program is designed to minimize the impact of Roundy's operations on the environment.
- **For this reason, NO TRACTOR IDLING is allowed on the premises when the temperature is above 10 degrees Fahrenheit.** The only exception to the "no idle rule" is when the temperature is below 10 degrees Fahrenheit. A short warm up may occur to prevent diesel fuel from gelling and engine startup difficulties.
- **No refer idling while parked at the dock.**
- Failure to comply with the above listed responsibilities will result in the refusal of your load and potential refusal of future deliveries into Roundy's facilities.

General Rules

- Dry Goods or Grocery receiving hours are from Midnight – 08:30 am.
- There are no receiving clerks available to receive Perishables or Frozen loads until 4:00 am.
- 20 MPH speed limit in yard.
- **Parking outside the Receiving Building is prohibited. You must park on the Commercial line or at your assigned dock door only.**
- No pets allowed – Pets must remain in the tractor or be taken off of the property.
- Smoking in designated area only.
- Tires must be chocked before unloading.
- It is the drivers' responsibility to unload and break down to Roundy's Ti x Hi configuration. Please resolve this with your dispatcher before backing into the dock.
- If you do not wish to unload, you can hire PLS (unloading service) Roundy's does not regulate fees charged by PLS. The clerk at the check-in window will direct you.
- If you have unacceptable pallets, you will be expected to restack onto good wood.
- Your dock person will show you where to place completed pallets.
- Your dock person may be assigned up to 5 loads at a time. There may be delays while waiting for the dock person. Breaks are posted on the bulletin board in the Receiving office. Your punctuality and patience is greatly appreciated
- During breaks and lunches, for safety reasons you are not allowed to continue working on unattended docks.
- While unloading, or on Roundy's premises, you are required to maintain a professional and business-like manner.
- Any driver or unloader not following these instructions or that creates a disturbance will be reloaded and the load will be rejected.
- Some departments may have special instructions, such as having all weights on the outside of the pallet on variable weight meats.
- Failure to comply with the above listed responsibilities will result in the refusal of your load and potential refusal of future deliveries into Roundy's facilities.

If you have any questions or concerns, please see a Shipping/Receiving Supervisor inside.

Thank you in advance for your continued cooperation,
The Roundy's Management Team (09/07)

Appendix D

WDNR Green Tier Sustainability
Metrics Spreadsheet

WISCONSIN DNR GREEN TIER SUSTAINABILITY METRICS

Period Covered:

Company Name:	Roundy's
Facility Name:	Oconomowoc Distribution Center
Address:	111 Delafield Rd.
City, State, Zip:	Oconomowoc, WI 53066
Environmental Coordinator:	Jim Fenzel
Coordinator Phone:	262-560-3345
Coordinator E-Mail:	james.fenzel@roundys.com

Metric	Not Collected/ Not Available	Quantity	Units	Period - If not Calendar Year
DEMOGRAPHICS				
Sales	x			
Money saved because of material or process improvements	x		\$	0
Profit or Loss	x		%	
Employees		675	Each	
Multiple between highest paid and lowest paid employee	x		%	
Alternative Transportation Support		53	Hide share participants	
Total Purchases	x		\$	
In-State Purchases	x		\$	
% of Purchases Made from Companies that participate in Green Tier or Green Masters:	x		%	
LAND				
Total Land		112	Acres	
Paved/Covered Land		Approx. 60	Acres or sq ft	
ENERGY				
Electricity		17,568,301	kWh	
		-4%	% reduction	
Natural Gas		241,509	therms	
Renewable Energy		-24%	%	
WATER				
Total Water Used		8,519,000	gallons/year	
		2%	% reduction	
Water Recycled/Reused			gallons/year	
			% reduction	
Regulated Pollutants Discharged			lbs/ year	
			% reduction	
AIR				
Total Air Emissions	x		lbs/ year	
	x		% reduction	
Ozone-Depleting Substances	x		lbs/ year	
	x		% reduction	
Greenhouse Gas Emissions	x		lbs/ year	
	x		% reduction	
WASTE				
Hazardous Waste Disposal (batteries)		45,000	lbs/ year	
		72%	% reduction	
Non-Hazardous Waste Disposal		1,034,740	lbs/ year	
		-36%	% reduction	
Material Recycled/ Reused		54,074,000	lbs/ year	
		-13%	% increase	
Recycled/ Reused Content			% of product	
TRANSPORTATION				
Hybrid Vehicles			Each	
Gasoline Used			Gallons	
Diesel Used		552,959	Gallons	
Alternative Fuels Used				
ADDITIONAL METRICS				
Please list all other certifications (for example: LEED, Energy Star, ISO 14001):				

Appendix E

Wisconsin Partners for Clean Air
Nomination Paper

2014 Recognition Award Nomination - Wisconsin Partners for Clean Air Award

WHD is pleased to nominate Roundy's Supermarkets, Inc. ("Roundy's") for the 2014 Wisconsin Partners for Clean Air Recognition Award. This nomination encompasses 2014 projects associated with both Roundy's retail stores and its Oconomowoc Distribution Center ("ODC") in Oconomowoc, Wisconsin.

Headquartered in Milwaukee, Wisconsin, Roundy's is one of the Midwest's oldest grocers. This results-driven company emphasizes its customers, communities and respect for its employees and strives to be a leader in its industry on multiple levels. Its commitment to the environment and its people begins with its upper management and permeates throughout the organization.

Roundy's is committed to exploring ways to reduce its environmental impact. This includes efforts at both its ODC, which continually evaluates and implements innovative technologies to reduce mobile air emissions as part of its Wisconsin Department of Natural Resources' ("WDNR") Green Tier commitment,¹ and as part of its overall corporate efforts.

It is our honor to share just a few of the company's 2014 initiatives that we believe reduced emissions or contributed to sustainability and improved air quality and that exemplify Roundy's environmental commitment.

Store Initiatives

- CO₂ Transcritical Refrigeration System

Supermarkets rely on refrigeration technology to keep produce fresh, dairy cold and freezer goods frozen. Due to the extensive need for refrigeration, the refrigeration technology chosen can have a significant impact on the environment and a retailer's bottom line.

In January, 2014 Roundy's took a large step toward realizing its vision of a hydrofluorocarbon-free future by installing a Hillphoenix Advansor Transcritical booster system at a new Pick-n-Save location in Menomonee Falls, Wisconsin.² This refrigeration system not only eliminates the use of hydrofluorocarbons ("HFCs") as the refrigerant, but includes energy efficiency features, such as the use of electronic case controls.³ It is the first store carbon dioxide ("CO₂") Transcritical installation in Wisconsin and only the third store in the United States.⁴

By replacing its standard refrigerant, R-507, with CO₂, Roundy's reduced the Global Warming Potential ("GWP") of the Menomonee Falls store's refrigerant. The GWP of a given

¹ Roundy's has participated in Green Tier since 2006. More detailed information on Roundy's Green Tier efforts can be found at <http://dnr.wi.gov/topic/GreenTier/Participants/index.html#tabx1>.

² See attached article, Michael Garry, *Roundy's Money-Saving CO₂ System*, *Accelerate*, Nov. 2014, at 26-28 for more detailed information about this project. On March 16, 2015, EPA notified Roundy's that its Menomonee Falls store was awarded EPA's GreenChill platinum-level certification.

³ *Id.* at 27.

⁴ *Id.* at 26.

refrigerant represents the amount a given mass of a chemical contributes to global warming over a given time period as compared to the same mass of CO₂.⁵ The Menomonee Falls store uses a refrigerant with a GWP of 1 (CO₂), instead of a refrigerant with a GWP of 3300 (R-507)⁶.

To ensure that it met its needs, Roundy's conducted an analysis comparing the new CO₂ Transcritical system to an existing Roundy's R-507 system over an 11-month period.⁷ For that time, the CO₂ Transcritical system resulted in a demand savings of 1,630kW, or 13,066,080kWh (equivalent to avoiding the annual greenhouse gas ("GHG") emissions of 1,897 passenger vehicles.)⁸ Roundy's intends to evaluate additional environmental benefits associated with this system, beyond its current reclamation of heat to generate hot water for the store.

Due to the documented and potential additional environmental and efficiency benefits, Roundy's decided in December, 2014, to standardize the CO₂ Transcritical technology for all new stores starting in 2016 and beyond, which includes the Shorewood, Wisconsin, store currently under construction.

- Food Waste to Animal Feed Program

In March of 2014, Roundy's initiated a project to divert food waste, ordinarily sent to landfills, to a recycling company that converted the wastes into animal feed. By year end, the ODC had aggregated and diverted a total of 1,558 tons of produce and bakery goods from Roundy's participating retail stores. This source reduction project resulted in an estimated reduction of 1,180 metric tons of CO₂e ("MTCO₂e,") equivalent to avoiding the annual GHG emissions of 248 passenger vehicles.⁹

- Recycling Efforts

Roundy's also continues its work towards greater waste minimization in other areas. The ODC serves as an aggregation point for the recycling of plastic, cardboard, and scrap metal for both the ODC and the retail stores it services. By diverting the following materials from landfill disposal, its 2014 recycling efforts resulted in calculated annual reductions of:

⁵ <http://www.epa.gov/ozone/geninfo/gwps.html>.

⁶ Rajan Rajendran, *Refrigerants Update*, Sept. 19, 2011, at p. 7, <http://www2.epa.gov/greenchill/refrigerants-update-september-19-2011>, last visited Mar. 17, 2015.

⁷ The system's operations were evaluated from February to December of 2014 (334 operational days.)

⁸ Roundy's compared direct 2014 demand measurements at the Menomonee Falls store for each rack to rack demand data from another Roundy's store. The total kilowatt hours savings = 8016 hours X 1630 kW. See <http://www.epa.gov/cleanenergy/energy-and-you/reduce.html> (using less energy reduces GHG and improves air quality) and <http://www.epa.gov/cleanenergy/energy-resources/calculator.html> (EPA Greenhouse Gas Equivalencies Calculator - used for all GHG equivalencies to passenger vehicles in this nomination.)

⁹ Conversion from food waste to metric tons of CO₂e performed by WDNR using http://epa.gov/epawaste/conserves/tools/warm/pdfs/WARM_Reuse_Approach_20100817.pdf, (models the reuse of materials or products using a source reduction alternate pathway.) According to EPA's attached "Modeling Reuse in EPA's Waste Reduction Model," source reduction and reuse conserve resources and reduce pollution, including greenhouse gas emissions that contribute to global warming. WDNR compared baseline comparisons of landfilling versus reduction for the animal feed project and recycling versus landfilling for the recycling efforts.

HDPE Plastics:	91 tons recycled	80 MTCO ₂ e
Mixed plastics:	834 tons recycled	861 MTCO ₂ e
Mixed metals:	58 tons recycled	252 MTCO ₂ e
Corrugated containers:	31,187 tons recycled	97,268 MTCO ₂ e
Total calculated recycling annual reductions:		<u>98,461 MTCO₂e¹⁰</u>

Oconomowoc Distribution Center

- Compressed Natural Gas Engine (“CNG”)

Roundy’s also made huge strides last year in its transportation initiatives.¹¹ In 2014, it incorporated a CNG tractor into its permanent ODC fleet.¹² According to EPA, CNG is an inherently cleaner burning fuel.¹³ From September to December, 2014, this model year (“MY”) 2015 CNG tractor traveled 16,431 miles, using 2,930 CNG equivalent gallons of fuel. WDNR calculated an estimated 33 short tons (65,964 pounds) reduction in CO₂ emissions through use of the CNG tractor as compared to a MY 2006 tractor traveling the same distance.¹⁴ Roundy’s intends to continue the use of this CNG as part of its permanent ODC fleet.

- LED Lighting – Freezer Area in Warehouse

Another project at the ODC in 2014 involved the replacement of 352 400W Metal Halide lights with 264 175 W LED high bays and occupancy sensors in the warehouse’s freezer section area. LEDs are microchips that emit light, offering benefits that include low power consumption, high output, long life, compact size, instant on/off, and reliable operation in cold temperatures.¹⁵ This project resulted in calculated actual annual demand savings of 201.84kW and annual usage savings of 1,284,030 kWh,¹⁶ which equates to approximately 885 MTCO₂e averted (equivalent to avoiding the annual GHG emissions of 186 passenger vehicles.)

Conclusion

We are proud to nominate Roundy’s for the 2014 Recognition Award for the projects outlined above which, in total, are equivalent to avoiding the annual GHG emissions of 23,066.3 passenger vehicles.

¹⁰ Total MTCO₂e is equivalent to avoiding annual GHG emissions of 20,729 passenger vehicles.

¹¹ The transportation sector is the second largest source of CO₂ emissions and comprises 27% of total GHG emissions in 2012. <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html>

¹² See attached Cummins Westport brochure, ISX12G, Heavy Duty Natural Gas Truck Engine.

¹³ <http://www.epa.gov/cleandiesel/technologies/fuels.htm#cng>

¹⁴ MY 2006 is the average model year of Roundy’s fleet at the time the CNG was in use. See attached WDNR calculations for additional criteria pollutant emission reductions associated with the use of the CNG. 65,964 pounds reduction in CO₂ emissions is equivalent to the annual GHG emissions of 6.3 passenger vehicles.

¹⁵ <https://focusonenergy.com/learning-center/technology/lighting-light-emitting-diodes-leds>.

¹⁶ Demand and usage savings calculated by Focus on Energy.

ROUNDY'S MONEY-SAVING CO₂ SYSTEM

Halfway through a year-long test, the Wisconsin chain's transcritical refrigeration system expends less energy than a comparable prototype system – and costs less to buy and install.

– by Michael Garry



Menomonee Falls Wisconsin

At the beginning of our conversation, Kevin Christopherson got right to the point:

“ I don't want us to have any HFCs in the future for refrigerants.”

Christopherson is energy program manager for Milwaukee-based Roundy's Supermarkets, a chain of 149 supermarkets in Wisconsin and Illinois that operate under five banners (Pick 'n Save, Copps, Metro Market, Rainbow and Mariano's). To achieve his vision of an HFC-free future for Roundy's, he became the driving force behind his company's test of a transcritical refrigeration system that does indeed eliminate HFCs in favor of natural refrigerant carbon dioxide.

As a refrigerant, CO₂ emissions from a leaky refrigeration system contribute very little to global warming compared to R-507, the HFC gas that Roundy's uses in its other stores. In fact, the ratio of their global warming potentials (GWPs) is 1 (CO₂) to 3,300 (R-507)

In December 2013, Roundy's kicked off its transcritical test, installing an Advansor CO₂-only booster system, from Hillphoenix, at a Pick 'n Save location in Menomonee Falls, Wis., near Milwaukee. The store, which officially opened on Jan. 14, 2014, became one of just a handful in the U.S. to test a transcritical unit, including a Hannaford Bros. outlet in Turner, Maine (see story, page 16) and a Whole Foods Market in Brooklyn, N.Y.

The Pick 'n Save transcritical system is expected to bring about a carbon footprint reduction of nearly 15 million pounds over 10 years – the equivalent of removing more than 1,230 cars from the road annually. And so far, it's proving to be less costly alternative to Roundy's prototype refrigeration, not only in operating expenses but in its initial cost and installation as well.

Christopherson, an engineer with 27 years of experience, spent two years evaluating whether Roundy's should test a CO₂-only technology, looking at what retailers have done in Europe and Canada, as well as talking to suppliers like Carnot Refrigeration and Hillphoenix. He developed a vision that encompassed getting rid of HFCs as well as lowering installation, operating and utility costs. Transcritical technology appeared to address those goals while fitting the northern climate in which Roundy's operates.

But the project would never have taken place without buy-in from Roundy's chairman and chief executive officer, Robert Mariano.

“Bob Mariano is focused on being sustainable and taking an environmentally friendly, green approach,” Christopherson told me. “Bob wants to know, is this going to save us money? Is it the

right thing to do in general? Is this going to make it better for customers and employees?"

To answer those questions, Christopherson has undertaken a detailed analysis of the transcritical system's performance, energy usage, maintenance requirements and overall costs. Roundy's requires a full year of data before coming to a firm conclusion, but through the halfway point, "everything looks positive," he said.

CHANGE IN PLANS

The Menomonee Falls store was originally slated to run Roundy's prototype refrigeration system, which since 2009 has employed glycol as a secondary refrigerant for medium-temperature cases, in concert with R-507 in the rest of the system. But that plan was scrapped and the transcritical system, supplied by Hillphoenix, was installed instead.

Christopherson put together a project plan for the refrigeration portion of the store and worked with the general contractor on implementing it. Considering that this was brand new technology never before installed by the contractor, the installation went smoothly, he said. "Did I baby sit the project? Darn right I did. I was involved in every aspect of the installation. But I was so, so pleased."

Prior to the installation, Hillphoenix and Parker Sporlan, provider of the Micro Thermo case controller and transcritical rack controller used at the store, held training sessions with the service and installation contractor, Zone Mechanical. "The training helped a lot," said Christopherson, who singled out Parker Sporlan for the outstanding support it gave during the installation process.

Before the transcritical system went live in December 2013, Roundy's had it commissioned, converting one case from medium to low temperature.

Service technicians, initially concerned about working with a high-pressure system, began to realize "that there are a lot of similarities to a regular DX [direct expansion] system," said Christopherson. "They started feeling a lot more comfortable." The Micro Thermo case controllers helped by providing very detailed information. "It's incredible what control they give you over the cases, with the ability to fine-tune the system," he said.

After the transcritical system started operating in December 2013, Roundy's had to bring it down before New Year's, when a sensor found that one of the racks was using too much oil. That turned out to have been caused by metal shavings left in an oil canister. "Since then, we've never had a problem with the system," said Christopherson.

From an energy perspective, the transcritical system has performed "surprisingly well," said Christopherson. Hillphoenix predicted before it went live that it would save Roundy's \$12,800 in annual utility costs compared with the retailer's prototype DX/glycol system installed at a similar store in Sheboygan, Wis. But the transcritical unit is on pace to save more than \$20,000 in its first year of operation, he said.

Adjusting for differences in the refrigeration loads of each store's medium- and low-temperature cases, Christopherson calculated that the transcritical system expended 20% less electricity than the prototype system.

The Micro Thermo case and rack controllers help lower energy usage and reduce temperature changes in display cases. Another energy saver comes from CO₂'s high heat of rejection. The heat generated by the transcritical system produces hot water for the store and may be used in other applications, such as area or floor heating.

One factor supporting a higher level of efficiency by the transcritical system was a cooler-than-average summer in southeastern Wisconsin. "If we had a normal summer, the energy savings would have been closer to [Hillphoenix's estimate]," said Christopherson.

Even so, the system went into transcritical mode, its least efficient stage, 30 times, he noted. This takes place when the outside (ambient) temperature reaches 88 degrees Fahrenheit – CO₂'s critical point, or the highest temperature (and pressure) where the refrigerant can still condense.

Christopherson said he learned that the ambient temperature doesn't need to reach 88 degrees for the transcritical state to be reached. It can happen when the condenser, located on the rooftop, hits that temperature. The Menomonee Falls store has a stone roof, which heats up "like AstroTurf," and can be hotter than the reported temperature.

continued on p 28



Snapshots

Dry Ice Snafu

One Saturday almost a year ago, as products were being stocked in a new Pick 'n Save store in Menomonee Falls, Wis., Kevin Christopherson received a frantic call regarding the transcritical CO₂-only refrigeration system just installed at the store.

"We got an evacuation alarm on CO₂," said Christopherson, energy program manager for Milwaukee-based Roundy's Supermarkets, owner of the Pick 'n Save banner. "I thought, oh no, is it leaking?"

It turned out to be a false alarm, as far as the refrigeration system was concerned. What triggered the alarm was CO₂ vapor that had evaporated from the dry ice used to keep product cold during shipment. A CO₂ leak detection sensor in the store's walk-in freezer reacted to the vapor.

Problem solved. Or was it? The incident made Christopherson concerned about the safety risk posed by dry ice being housed in an enclosed storage area. Roundy's uses a CO₂ detection sensor only in the transcritical store's walk-in freezer – not in any of its other supermarkets.

"If you have dry ice in a confined space, it can push out the oxygen, which makes it dangerous," he said. "It opened my eyes to packing food in dry ice."

Christopherson has talked to Roundy's maintenance department about installing CO₂ sensors in all walk-in freezers as a precaution. He wonders whether dry ice should be necessary in delivery trucks with refrigerated storage. "This is a real concern."

Other Green Features

In addition to its transcritical CO₂ refrigeration system, Roundy's Pick 'n Save store in Menomonee Falls, Wis., has a host of other environmentally friendly features:

- All energy and water performance is controlled in real time with a building automation system.
- High-efficiency LED lighting technology, controlled by motion sensors or the building automation system, is installed throughout the interior and exterior of the store, including case fixtures, the walk-in cooler and freezer, and the refrigeration prep room.
- Daylight harvesting uses natural light to reduce electricity demand.
- The store uses highly efficient HVAC equipment coupled with constant air balancing, and supplemented by CO₂ monitoring and dehumidication.
- The building's foundation and wall sections were manufactured with recycled materials.
- The concrete floors eliminate the need for additional floor coverings or hazardous cleaning chemicals.
- Restrooms include low-flow motion-activated urinals and hand sinks.
- Paints and adhesives have little if any volatile organic compounds.
- Packing material, food scraps and cooking oils are recycled or repurposed.
- Environmentally friendly and non-harmful cleaning chemicals are used to maintain the store.

→ Having gone through the summer, Christopherson still wants to assess the third quarter's energy numbers before coming to a definitive conclusion about the transcritical system's energy efficiency. (He expects the fourth quarter's results to be the same as the first quarter's.) If the third quarter pans out, he thinks a second transcritical store could be planned for the Chicago market in late 2015.

From a maintenance point of view, the transcritical system has been "on par or better" than the prototype system, he said. However, Christopherson is reserving judgment on maintenance until the system is older. "Everything looks great now but the system's new," he said. "How's it going to perform in two or three years?"

The higher pressures associated with transcritical technology have not been a problem for the Pick 'n Save store. According to Hillphoenix, the transcritical system's pressure-reducing valves, which are set for 580 to 1,740 psig, should ensure that "everything inside of the store operates under lower pressure, as it would with an HFC system." As a further precaution, carbon steel is used to reinforce the compressor racks, and the piping to and from the gas cooler is made of either carbon steel or stainless steel.

"The only people concerned about the high pressures are the service people who support the system," said Christopherson. "And they have been with it eight-plus months and have seen no issues."

"I know the system is designed for [high pressures]," he added. "It doesn't make me nervous. But is it always a concern in the back of my mind? Yes. If they designed a CO₂ system that didn't go into transcritical mode, I'd probably lean toward that."

COST ANALYSIS

Christopherson provided a breakdown comparing the capital costs incurred by the transcritical system to what the prototype DX/glycol system that was originally slated to go into the Menomonee Falls store would have cost.

The transcritical system, under warranty for one year, cost 21.4% more than the prototype (actual dollar figures were unavailable for publication). In addition, the transcritical technology required CO₂-ready fixtures that cost 11.6% more, and electrical circuitry that was 31.7% higher; it also called for low-voltage wiring and touchscreens that were not used in the prototype system.

On the other hand, the installation cost of the transcritical system was 25.6% less than that of the prototype, partly because it required less piping and used low-voltage wiring. Roundy's was also able to obtain steel support credit and energy incentives for the transcritical system. Moreover, CO₂, which was included in the installation cost, runs only .99 cents per pound, compared to \$8 per pound for the R-507 used by the prototype system, creating a considerable cost difference in the initial refrigerant charge.

All told, the transcritical system's equipment and installation costs were estimated by the *Milwaukee Journal Sentinel* to run \$1.8 million. The actual costs came in under that amount, said Christopherson – and ended up being about 1% less than those of the prototype system. (He did not factor in the maintenance or energy savings observed at the Menomonee Falls store into this cost calculation.) "There's potential to save more money [in a future installation]," said Christopherson. "That's what makes it exciting."

While he is still holding back on a full-fledged commitment to transcritical technology until more data comes in, Christopherson is hoping CO₂ refrigeration takes off. "I am very for CO₂," he said. ■ MG



System Specs

Pick 'n Save's transcritical booster system, from Hillphoenix, Conyers, Ga., has the following features:

- Two racks (A and B), each with seven compressors
- Low-temperature capacity 201,000 BTUs/hour (Rack A) and 203,000 BTUs/hour (Rack B)
- Medium-temperature capacity 816,000 BTUs/hour (Rack A) and 697,000 BTUs/hour (Rack B)
- UL-approved compressors and controllers
- Electric defrost system
- Micro Thermo case controller and rack controller from Parker Sporlan
- Hillphoenix cases incorporating Clearvoyant LED lights

Modeling Reuse in EPA's Waste Reduction Model

Reuse of materials or products is a form of source reduction that can be modeled in EPA's Waste Reduction Model (WARM) using the "source reduction" alternate pathway along with a few additional steps. [Source Reduction](#) refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) that reduces the amount of material entering the waste collection and disposal system. Source reduction and reuse conserve resources and reduce pollution, including greenhouse gas (GHG) emissions that contribute to global warming. Reusing an item reduces the need for new materials and delays or prevents materials from entering the waste stream.

Examples of **Reuse** include:

- Reusing a plastic crate twenty times before recycling it
- Donating a personal computer to a school program or non-profit organization for continued use
- Reusing a cardboard box one time before recycling it

Modeling Reuse in WARM

The total number of times a material or product is reused influences the benefits accrued from reuse. The energy and GHG results from modeling in WARM indicate life-cycle benefits from avoided upstream manufacture of new material plus the avoided downstream disposal emissions of one use.

Users can estimate the GHG and energy benefits of reuse by following these steps:

1. Run WARM using a baseline scenario of recycling, landfilling, combustion, or composting and an alternate waste management scenario of source reduction. The choice of the baseline pathway depends upon the original fate of the material. For example, if the item was originally destined for a landfill and now will be reused, the baseline scenario is landfilling.
2. If using the Excel version of WARM, select whether the material that is reused is manufactured from 100% virgin inputs or the current mix of virgin and recycled inputs. The default choice for this option is current mix of inputs. Selecting manufacture from 100% virgin inputs will result in an upper bound estimate of the benefits from reuse. Note that this option is not available in the web-based version of WARM, which uses the default of the current mix.
3. Multiply the energy and GHG emissions reduction result ("Total Change in GHG Emissions") by the number of times the material is reused. This reuse number should equal one less than the number of total uses to account for the production of the initial material.

The following formula summarizes this basic methodology for reuse:

$$GHG \text{ Benefits of Reuse} = (N - 1) \times (A)$$

Where,

N = Number of total uses

A = GHG benefits of the source reduction ("Total Change in GHG Emissions")

Example Application

To illustrate the application of this approach, consider reusable HDPE plastic crates, weighing 1,000 tons total, used for transporting bread to a grocery store. Assume that the crates are each used 20 times before wearing out, and are subsequently recycled. In order to calculate the GHG benefits of reusing the crates, run WARM using a baseline of recycling 1,000 tons HDPE and an alternate scenario of source reducing 1,000 tons HDPE. Under the upper bound scenario of 100% virgin inputs, this calculation indicates that source reducing 1,000 tons HDPE results in a net emissions reduction of 583 metric tons of carbon dioxide equivalent (MTCO₂E) relative to the baseline recycling scenario. Under the more conservative scenario of the current mix of inputs, source reducing 1,000 tons HDPE results in a net emissions reduction of 403 MTCO₂E relative to the baseline recycling scenario.

Next, multiply the GHG benefits by 19 (20 total uses – 1 original use). In equation form:

$$GHG\ Benefits\ of\ Reuse = 19 \times (\text{source reduction of 1,000 tons HDPE} - \text{recycling of 1,000 tons HDPE})$$

100% virgin inputs (upper bound for reductions):

$$GHG\ Benefits\ of\ Reuse = 19 \times (583\ MTCO_2E) = 11,077\ MTCO_2E$$

Current mix of inputs (conservative estimate):

$$GHG\ Benefits\ of\ Reuse = 19 \times (403\ MTCO_2E) = 7,657\ MTCO_2E$$

A similar methodology can be used to calculate the relative GHG benefits of reuse under different baseline conditions. For example, to calculate the relative benefits of (a) reusing the HDPE crate when the baseline is recycling versus (b) reusing the HDPE crate when the baseline is landfilling, the user would run each of these scenarios using the methodology above and then subtract the results to obtain relative GHG benefits. These calculations show that reusing 1,000 tons HDPE 20 times (as above), when the baseline is landfilling rather than recycling results in additional reductions of 27,379 MTCO₂E. Thus, the relative GHG benefits of reusing items that are destined for landfills are much higher than reusing items that are recycled at end-of-life. However, in both cases, reuse provides significant GHG benefits.

Limitations

The approach described here does not consider the durability of materials and products. Depending on the type of material and how the material is used, there is a limit on the number of times a material can be reused. It is important to consider durability when modeling reuse.



Roundy's Supermarkets – Menomonee Falls, WI

– Platinum Level Certification –

**Certified by U.S. EPA's GreenChill Partnership
for using green refrigeration technology**

Certified through March 9, 2016

March, 2015

Roundy's Supermarkets, Inc.

WDNR CNG HD Truck and Recycling Emissions Calculations

Using MOVES, for model year 2006 the emission factors (in grams per mile) are:

NOx: 12.190 g/mile * 16,431 miles travelled = 200,294 / 454 = 441 pounds
PM2.5: 0.845 g/mile * 16,431 miles travelled = 13,884 / 454 = 31 pounds
VOC: 1.074 g/mile * 16,431 miles travelled = 17,647 / 454 = 39 pounds
CO: 3.381 g/mile * 16,431 miles travelled = 55,553 / 454 = 122 pounds
CO2: 2,110.000 g/mile * 16,431 miles travelled = 34,669,410 / 454 = 76,364 pounds (38 tons)

Using EPA Diesel Quantifier using MY 2015 CNG Fuel and 2930 CNG equivalent gallons:

NOx: 0.012 short tons or 24 pounds
PM2.5: 0.000 short tons or 0 pounds
VOC: 0.001 short tons or 2 pounds
CO: 0.008 short tons or 16 pounds
CO2: 5.2 short tons or 10,400 pounds

CNG Heavy Duty Truck Emission Reductions:

NOx: 417 pounds
PM2.5: 31 pounds
VOC: 37 pounds
CO: 106 pounds
CO2: 33 short tons or 65,964 pounds

Hope this helps
Have a great day!

Using the updated EPA WARM Model, I came up with the following data:

91 tons HDPE (Clear Plastic) Landfilled = + 4 MTCO2E
91 tons HDPE (Clear Plastic) Recycled = - 80 MTCO2E
31,187 tons corrugated containers (Cardboard) Landfilled = + 16,066 MTCO2E
31,187 tons corrugated containers (Cardboard) Recycled = - 97,268 MTCO2E
1,558 tons food waste (non-meat) Landfilled = + 1,176 MTCO2E
1,558 tons food waste (non-meat) Reduced = - 1,180 MTCO2E
58 tons of mixed metal landfilled = + 2 MTCO2E
58 tons of mixed metal Recycled = - 252 MTCO2E
834 tons of mixed plastics landfilled = + 32 MTCO2E
834 tons of mixed plastics Recycled = -861 MTCO2E

BASELINE Scenario = +17,280 MTCO2E
Alternative Waste Management Strategy = -99,642 MTCO2E
Total Change = -116,922 MTCO2E

Cummins Westport
The Natural Choice



ISX12 G

Heavy-Duty Natural Gas Truck Engine



The Natural Choice. ISX12 G Heavy-Duty Natural Gas Truck Engine.

The Cummins Westport ISX12 G natural gas engine delivers the strong pulling power and heavy-duty durability required for regional-haul truck/tractor, vocational and refuse applications. It features Stoichiometric cooled Exhaust Gas Recirculation (SEGR) combustion technology, which allows the use of a maintenance-free Three-Way Catalyst (TWC). Ratings range from 320 hp to 400 hp (239-298 kW) with 1450 lb-ft (1966 N•m) of peak torque. The inherent efficiency of this engine and an abundant supply of natural gas reduce operating costs, making the ISX12 G the natural choice for your fleet.

Dedicated Factory-Built Natural Gas Engine.

The ISX12 G is a dedicated, factory-built natural gas engine that is based on the Cummins ISX12 diesel engine. The ISX12 G shares many of the same parts and components as its diesel counterpart, and it operates on 100 percent clean-burning, low-cost natural gas. The ISX12 G meets current U.S. Environmental Protection Agency (EPA) and California Air Resource Board (ARB) emissions standards, and 2014 EPA greenhouse gas (GHG) and U.S. Department of Transportation (DOT) fuel-economy regulations.

The ISX12 G is a great choice for mixer, dump truck and refuse applications, with a high power-to-weight ratio and 700 lb-ft (949 N•m) of clutch engagement torque. Four refuse ratings, as well as Front Engine Power Take-Off (FEPTO) and Rear Engine Power Take-Off (REPTO) options, offer power and flexibility for a wide variety of vehicles.

The ISX12 G is also the natural choice for regional-haul and LTL distribution operation trucks and tractors. Five ratings from 320 hp to 400 hp (239-298 kW), engine braking, and manual or automatic transmission capability provide trucking customers with the performance to meet fleet requirements, and the flexibility of using either compressed natural gas (CNG) or liquefied natural gas (LNG).

Advanced Combustion Technology.

The ISX12 G uses SEGR combustion with spark ignition to create a high-performance, heavy-duty natural gas engine. The cooled-EGR system takes a measured quantity of exhaust gas and passes it through a cooler to reduce temperatures before mixing it with fuel and the incoming air charge to the cylinder. SEGR results in improved power density and fuel economy versus traditional stoichiometric or lean-burn natural gas engines. This technology also enables the use of a TWC for emissions control.

Maintenance-Free Aftertreatment.

TWCs are effective, simple, passive devices packaged as part of the muffler. They provide consistent emissions control performance, are maintenance-free and can be mounted vertically or horizontally on the vehicle. The ISX12 G requires no active aftertreatment such as a Diesel Particulate Filter (DPF) or Selective Catalytic Reduction (SCR).



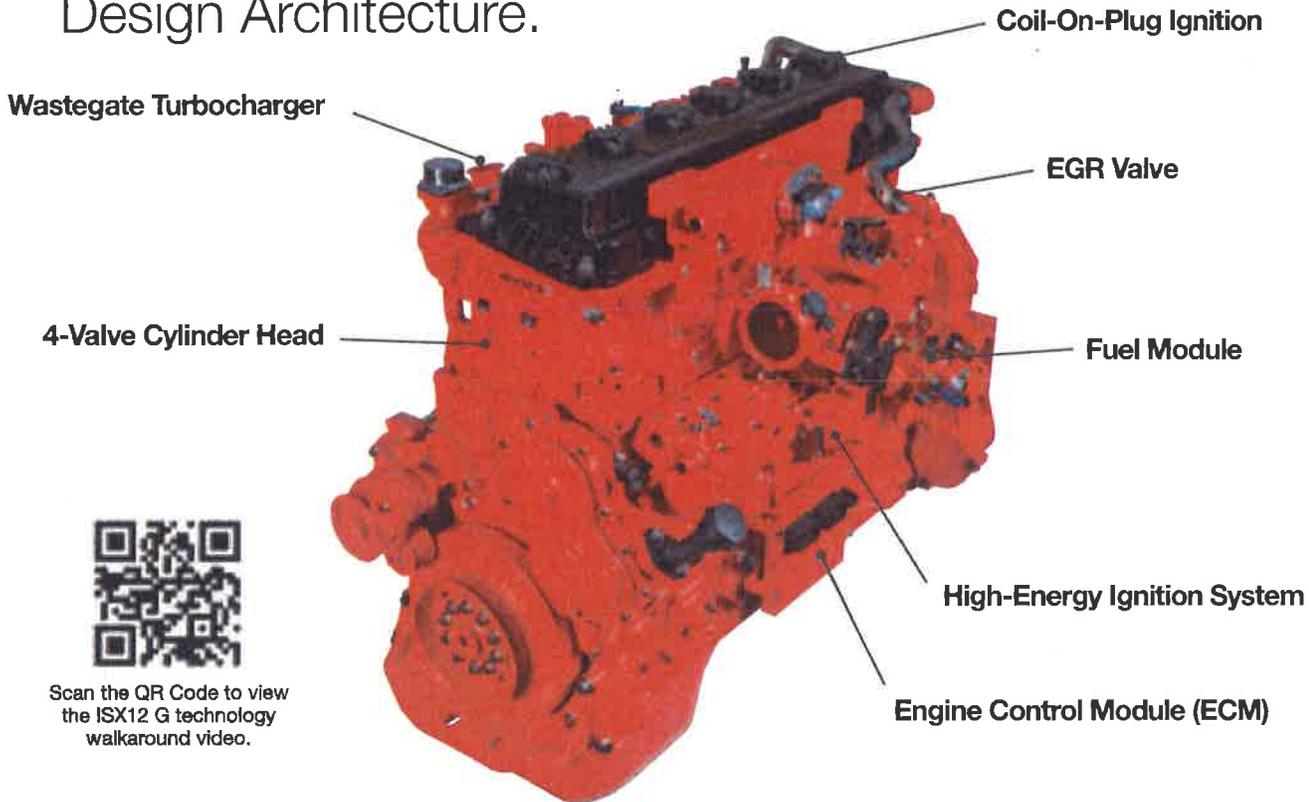
Natural Gas – The Fuel Choice Is Yours.

The ISX12 G operates on 100 percent natural gas, which can be carried on the vehicle in either compressed or liquefied form (CNG or LNG, respectively). The ISX12 G can also run on renewable natural gas (RNG) made from biogas or landfill gas that has been upgraded to vehicle fuel-quality. A variety of CNG and LNG tank configurations are available to meet range requirements. Consult your vehicle manufacturer for details.



ISX12 G

Design Architecture.



Scan the QR Code to view the ISX12 G technology walkaround video.

Features And Benefits.

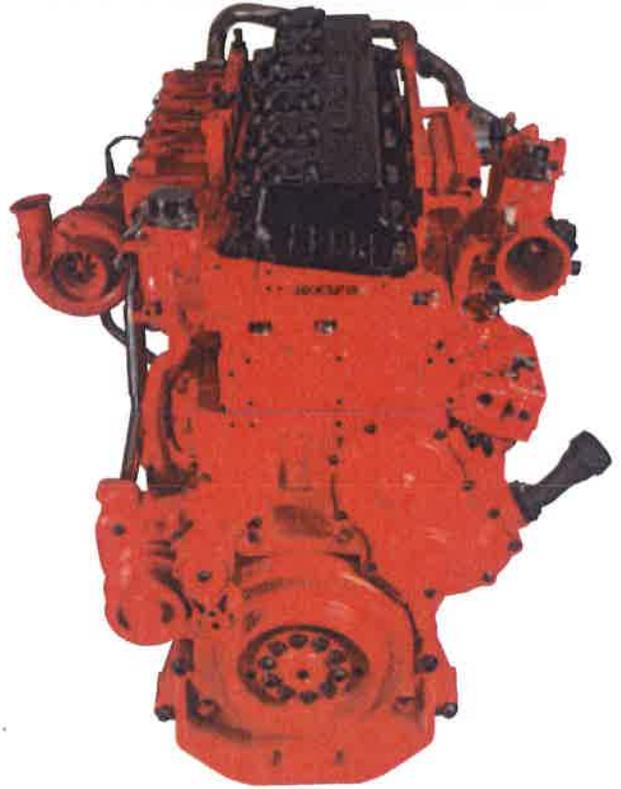
- **Advanced Air Handling** – Electronic control for precise air handling.
- **Proven Wastegate Turbocharger** – A small-frame, fixed-geometry, wastegate-style turbocharger is used. A water-cooled bearing housing adds durability.
- **Engine Control Module (ECM)** – Constantly monitors and controls engine sensors, fuel system and ignition system. Drive-by-wire throttle control. Provides OEM and end-users with the ability to tailor performance of the engine to fit the vehicle's mission. Full interface capability to Cummins INSITE™ and Cummins QuickCheck diagnostic service tools.
- **High-Energy Ignition System** – Provides better performance and longer service intervals, improved spark plug and coil durability and self-diagnostics. The ignition module and fuel module are controlled by a full-authority CM2180A ECM with programmable features, which is compatible with Cummins diagnostic tools.
- **Accessory Belt Drive System** – Self-tensioning serpentine polyvee belt accessory drive system for water pump, engine-mounted fan hub and most alternators.
- **Air Intake System** – Charge-air cooling reduces emissions by lowering intake manifold air temperatures.
- **High-Efficiency Lube Cooler** – Lowers oil temperatures, for longer engine life.
- **Crankshaft** – The eight-counterweight, fully balanced, high-tensile-strength steel forging has induction-hardened fillets and journals, for outstanding durability.
- **Optional Engine Braking** – 240 hp (180 kW) at 2100 rpm.
- **Transmission** – Automatic and manual options available.
- **Front- and Rear Engine Power Take-Off (FEPTO and REPTO)** – Options provide additional torque, for a variety of vocational applications.

ISX12 G Ratings

Engine Model	Advertised hp (kW)	Peak Torque lb-ft (N•m) @ rpm	Governed Speed
Line Haul Truck Applications			
ISX12 G 400	400 (298)	1450 (1966) @ 1200	2100 RPM
ISX12 G 385	385 (287)	1350 (1830) @ 1200	2100 RPM
ISX12 G 350	350 (261)	1450 (1966) @ 1200	2100 RPM
ISX12 G 330	330 (246)	1250 (1695) @ 1200	2100 RPM
ISX12 G 320	320 (239)	1150 (1559) @ 1200	2100 RPM
Refuse Truck Applications			
ISX12 G 350R	350 (261)	1350 (1830) @ 1200	2100 RPM
ISX12 G 350R	350 (261)	1450 (1966) @ 1200	2100 RPM
ISX12 G 330R	330 (246)	1250 (1695) @ 1200	2100 RPM
ISX12 G 320R	320 (239)	1150 (1559) @ 1200	2100 RPM

ISX12 G Specifications

Maximum Horsepower	400 HP	298 kW
Peak Torque	1450 LB-FT	1966 N•m
Governed Speed	2100 RPM	
Clutch Engagement Torque	700 LB-FT	949 N•m
Type	4-cycle, spark-ignited, in-line 6-cylinder, turbocharged, CAC	
Engine Displacement	726.2 CU IN	11.9 LITERS
Bore and Stroke	5.11 IN x 5.91 IN	130MM x 150MM
Operating Cycles	4	
Oil System Capacity	12 U.S. GALLONS	45.4 LITERS
Coolant Capacity	26.5 U.S. QUARTS	25.1 LITERS
System Voltage	12 V	
Net Weight (Dry)	2,650 LB	1,202 KG
Fuel Type	CNG/LNG/RNG	
Aftertreatment	Three-Way Catalyst (TWC)	



ISX12 G Maintenance Intervals

Maintenance Item	Miles/Kilometers	Hours	Months
Spin-On Fuel Filter	Daily Check		
Oil And Filter*^	18,000 MI 30,000 KM	400	6
Coolant Filter**	67,500 MI 108,500 KM	1,500	12
Spin-On Fuel Filter*	45,000 MI 72,300 KM	1,000	12
Spark Plugs*	67,500 MI 108,500 KM	1,500	12
Overhead Adjustment*	67,500 MI 108,500 KM	1,500	12
Engine Brake Adjustment	270,000 MI 435,000 KM	6,000	24
Standard Coolant	270,000 MI 435,000 KM	6,000	24
Air Cleaner/Element	Follow vehicle manufacturers published recommendations		

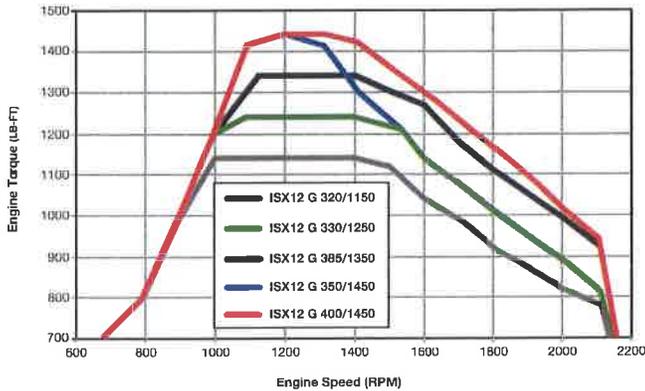
*Assuming normal duty cycle/based on 45 mph (72.4 kph) average speed. Spark plug interval and overhead adjustment must be reduced for slower speed applications.

**Do not change if SCA above 3.

^Requires natural gas engine oil (CES20074).

- > Intervals for normal duty – must be reduced for lower average speeds/duty cycles.
- > Default interval is the hours stated. Interval is whichever comes first – hours, miles or months.
- > Refer to Owners Manual for complete details on maintenance intervals.

ISX12 G Torque Curves.



With torque curves similar to those of the ISX12 diesel within the 1150 lb-ft-to-1450 lb-ft (1559-1966 N•m) range, the ISX12 G offers comparable vehicle performance and drivability.

Gearing Recommendations.

For best reliability and durability, the recommended maximum GVW for the ISX12 G in line-haul applications is 80,000 lb (36,287 kg). Recommended gearing is 1400 rpm to 1450 rpm at cruise speed, to optimize fuel economy.

Optimizing Performance With PowerSpec.

Cummins PowerSpec helps you find the ideal gearing specs for engine performance or fuel economy, making it possible to tailor the operation of Cummins Westport engines to fit every customer's application. PowerSpec can also read fault codes, and can be programmed to collect trip information for multiple drivers. PowerSpec works on both the ISL G and the ISX12 G.

See powerspec.cummins.com for more information.

Base Warranty.

The automotive base warranty for the Cummins Westport ISX12 G natural gas engine is the same as for the Cummins diesel base platform. Base warranty covers 2 years/250,000 miles (402,336 km) and 100 percent parts and labor on warrantable failures.*

*Warrantable failures are those due to defects in Cummins material or factory workmanship.

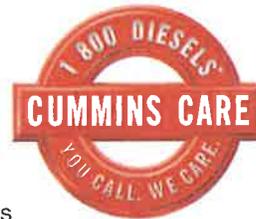


Extended Coverage.

For additional peace of mind, Cummins Westport offers a variety of extended coverage plans to meet every customer's need. For details on extended coverage options, contact your local Cummins distributor or Cummins Westport representative.

Better Customer Care.

Cummins Westport-powered vehicles are supported by Cummins service network, the largest and most capable in North America. Cummins authorized technicians are fully trained on Cummins Westport natural gas engines, with ready access to Genuine Cummins Parts and warranty support. For questions regarding your Cummins Westport engine, or for assistance in finding a repair facility in the United States or Canada, call Cummins Care at 1-800-DIESELS™ (1-800-343-7357).



Cummins Westport – The Natural Choice.

Cummins Westport Inc. designs, engineers and markets 6- to 12-liter spark-ignited natural gas engines for commercial transportation applications such as trucks and buses. Our dedicated 100 percent natural gas engines are manufactured by Cummins, and are available as a factory-direct option from leading truck and bus manufacturers.

To learn more about Cummins Westport and natural gas as a transportation fuel, visit the Cummins Westport Natural Gas Academy for information, resources, videos and more – at cumminswestport.com/natural-gas-academy.



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Objectives & Targets from 2014 Green Tier Annual Report
Roundy's Oconomowoc Distribution Center
Oconomowoc, Wisconsin

1. Minimize Energy Use

Objective: Reduce electricity and natural gas usage at Oconomowoc warehouse.

Target: Seeking a 2% to 3% reduction at the Oconomowoc warehouse of 2014 levels by tracking kW hours and Therms.

Objective: Explore use of fuel cell technology in forklift batteries using 900 amp hydrogen/lithium batteries.

Target: Test battery life versus current batteries. Evaluate cost of battery and its life versus standard batteries.

Objective: Potential test of solar energy

Target: If test is implemented, chart energy saving versus cost to implement. Calculate payback.

2. Waste Minimization

Objective: Reduce volume sent to landfills

Target: Increase recycle of cardboard and plastic by 2% to 3% over 2014 levels

Objective: Continue evaluation of Compost program which started in 2013 and expanded to 28 stores in 2014.

Target: Perform cost benefit analysis to see if it can be rolled out to more stores.

3. Stakeholder Education

Objective: Educate employees on EMS, conservation and waste reduction

Target: Management will cover topics relating to each of these subjects in quarterly EMS meetings.

Objective: Educate store personnel on EMS, conservation, and waste reduction

Target: Give one tour a quarter of the Oconomowoc Distribution Center to store personnel

Objective: Educate other businesses regarding Green Tier and benefits of EMS.

Target: Conduct two educational speeches or meetings per year to outside parties.