

**VOLVO**

**VOLVO GROUP**

# The Volvo Group.

100,000 employees. 190 markets.  
Production facilities in 18 countries.

We are one of the world's leading  
manufacturers of trucks, buses,  
construction equipment, and marine  
and industrial engines.



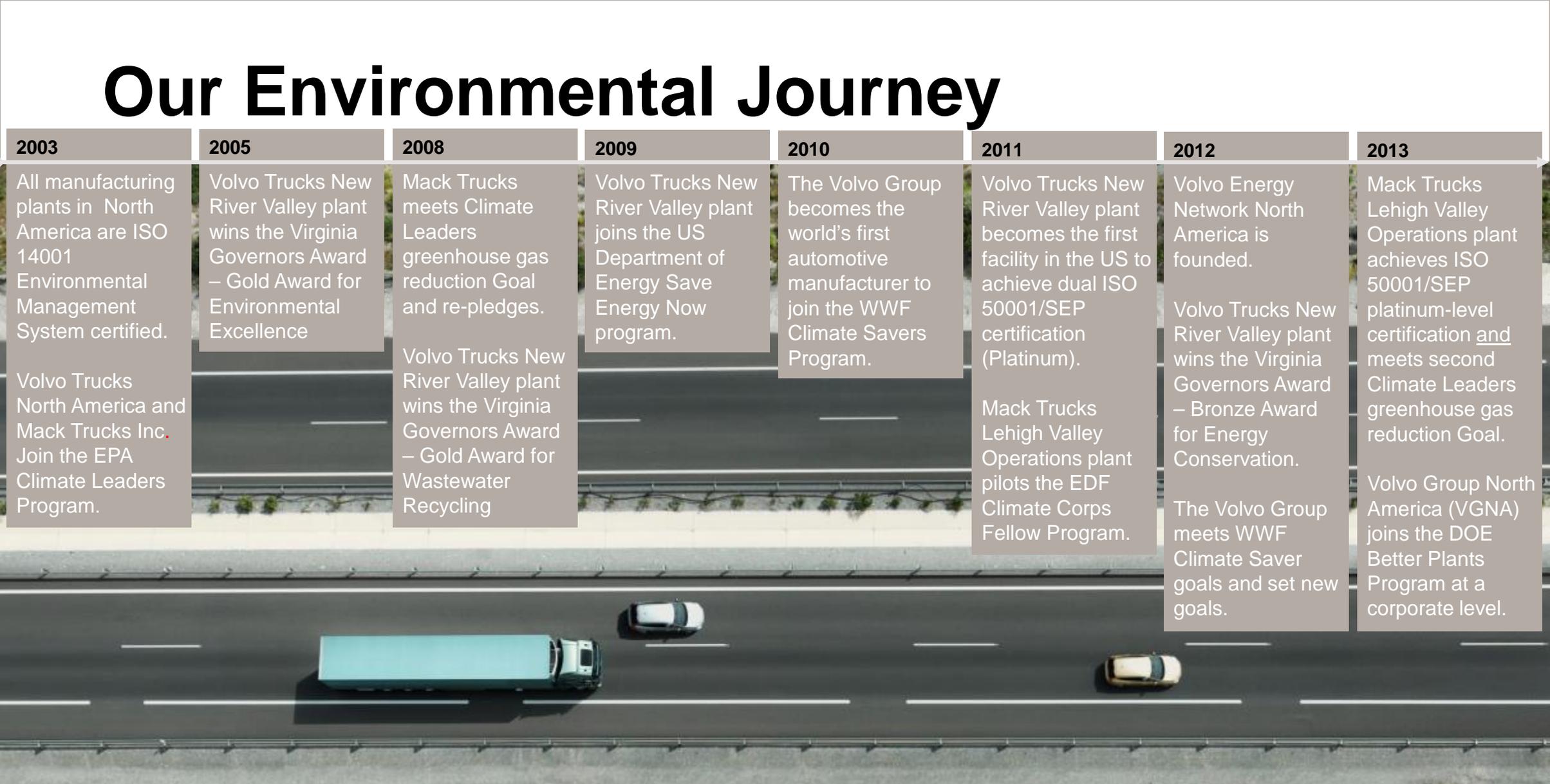
**Driving prosperity, in all aspects of the word, means that the impact on the environment and the usage of our societies limited resources are considered in our activities.**



# **Volvo Group North America**

Environmental Achievements

# Our Environmental Journey



2003	2005	2008	2009	2010	2011	2012	2013
<p>All manufacturing plants in North America are ISO 14001 Environmental Management System certified.</p> <p>Volvo Trucks North America and Mack Trucks Inc. Join the EPA Climate Leaders Program.</p>	<p>Volvo Trucks New River Valley plant wins the Virginia Governors Award – Gold Award for Environmental Excellence</p>	<p>Mack Trucks meets Climate Leaders greenhouse gas reduction Goal and re-pledges.</p> <p>Volvo Trucks New River Valley plant wins the Virginia Governors Award – Gold Award for Wastewater Recycling</p>	<p>Volvo Trucks New River Valley plant joins the US Department of Energy Save Energy Now program.</p>	<p>The Volvo Group becomes the world's first automotive manufacturer to join the WWF Climate Savers Program.</p>	<p>Volvo Trucks New River Valley plant becomes the first facility in the US to achieve dual ISO 50001/SEP certification (Platinum).</p> <p>Mack Trucks Lehigh Valley Operations plant pilots the EDF Climate Corps Fellow Program.</p>	<p>Volvo Energy Network North America is founded.</p> <p>Volvo Trucks New River Valley plant wins the Virginia Governors Award – Bronze Award for Energy Conservation.</p> <p>The Volvo Group meets WWF Climate Saver goals and set new goals.</p>	<p>Mack Trucks Lehigh Valley Operations plant achieves ISO 50001/SEP platinum-level certification and meets second Climate Leaders greenhouse gas reduction Goal.</p> <p>Volvo Group North America (VGNA) joins the DOE Better Plants Program at a corporate level.</p>

# Our Environmental Journey Continues

2014

Hagerstown Powertrain plant achieves ISO 50001/SEP platinum-level certification.

VGNA raises Better Plants Program participation to Challenge Level.

2015

VGNA achieves the Industrial Energy Technology Conference Award.

VGNA achieves Better Plants Goal (26.8 % improvement in Energy Performance) and re-pledges.

2018

Volvo Trucks New River Valley plant achieves the first Volvo Group Landfill Free Certification

2019

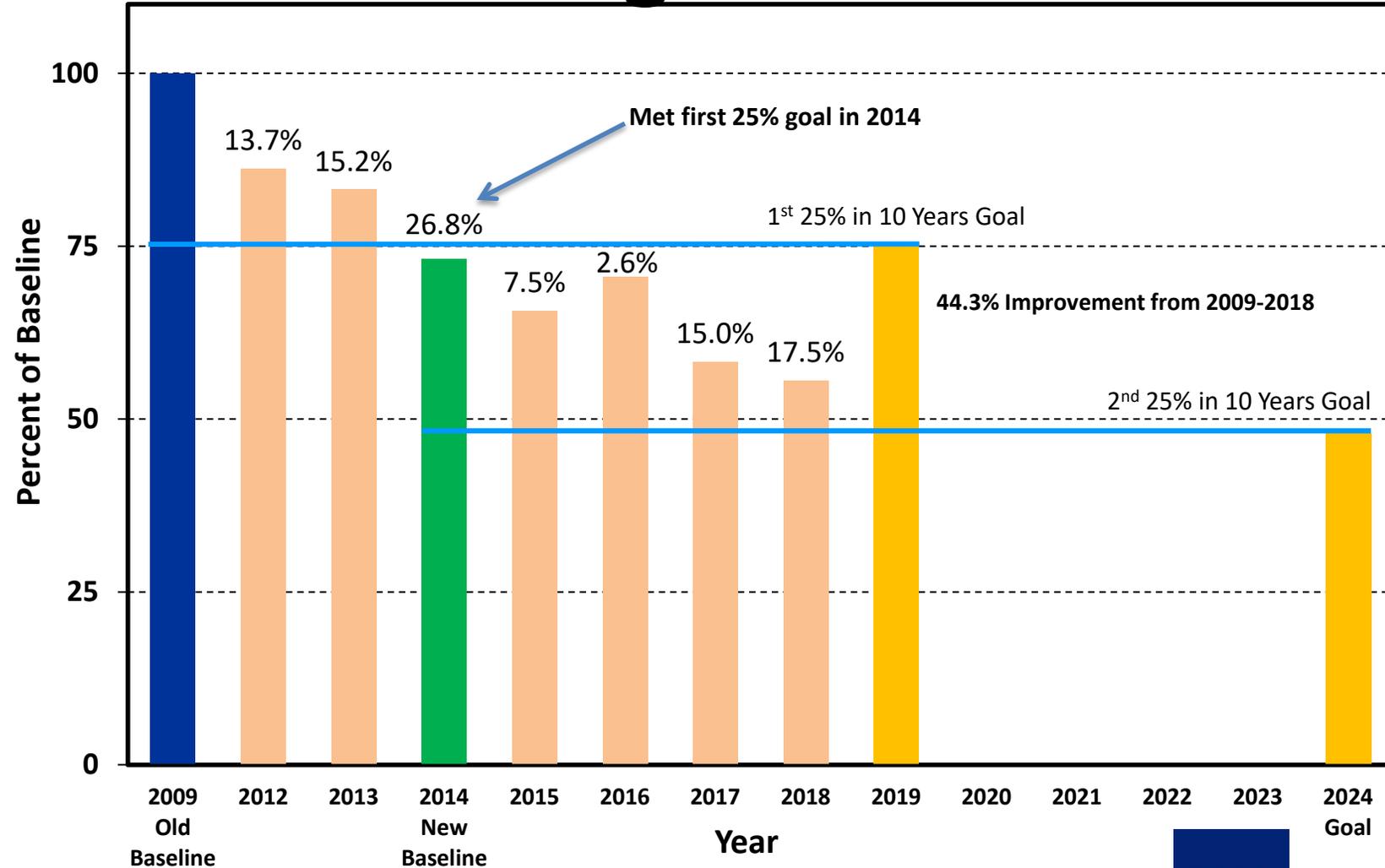
Volvo Group North America manufacturing facilities switch to 100% renewable energy.

Mack Trucks LVO plant and Volvo Powertrain Middletown plant achieve Volvo Group Landfill Free Certification.

VGNA joins the Better Plants Supply Chain Program.

# US DOE Better Plants Program

- Volvo Group committed to reducing energy consumption by 25% over a ten year period (2009 baseline) and met the goal 5 years early
- Committed to an additional 25% reduction in 2014.



# Renewable energy

- The following facilities, located in non-regulated electricity markets, purchase renewable energy to match their yearly electricity usage (297,919 MWh in 2019)

- Lehigh Valley Operations
- Hagerstown
- Shippensburg
- Middletown
- Plattsburgh
- Joliet
- Elkridge
- Allentown



- Hagerstown Powertrain has completed two solar installations with a capacity of 3.5 MW
  - Solar parking lot canopy – 1.3 MW
  - Ground mount installation – 2.2 MW



# Landfill-free facilities

- New River Valley became the first facility to receive the Volvo Group Landfill-free certification in 2018
- Lehigh Valley Operations and Middletown Remanufacturing received the certification in 2019
- Hagerstown will begin the 12 month Landfill-free certification journey in Q4-2019



An aerial photograph of a large industrial facility, identified as the Volvo Group Trucks plant in Hagerstown, MD, during the "blue hour" of dusk. The sky is a mix of soft orange and deep blue. In the foreground, a prominent white water tower stands on a lattice steel structure, with "VOLVO" and "TRUCK" logos visible on its tank. A blue square graphic is overlaid on the image, containing the Volvo logo and the text "VOLVO GROUP". The factory complex in the background consists of numerous large, interconnected buildings with flat roofs. The surrounding area includes green fields and distant hills under a twilight sky.

**VOLVO**  
VOLVO GROUP

# Total Waste Reduction

Mark Pannell - Environmental & Energy Manager

Volvo Group Trucks – Hagerstown, MD

# Our Products.

Rear Axle

11L Engine

13L Engine

AMT

T300

**Mack  
Trucks**



MP7



MP8



mDRIVE



**Volvo  
Trucks NA**



D11



D13



I-Shift

**Prevost |  
Volvo Bus**



D13



I-Shift

**Component Machining: Crankshafts | Camshafts | Rear Pinion, Power Divider & Carrier Housings | Gears & Shafts**

# We Deliver.

HAGERSTOWN ★



## **MACK TRUCKS**

Lehigh Valley, PA  
Latin America



## **VOLVO TRUCKS**

New River Valley, VA



## **VOLVO BUS**

Mexico City, Mexico



## **PREVOST**

Sainte-Claire, Canada  
Plattsburg, NY



HAGERSTOWN, MD

# We Are the Heart.

We are a unique team of 1,800 members, combining Technology, Purchasing, & Operations on one campus.

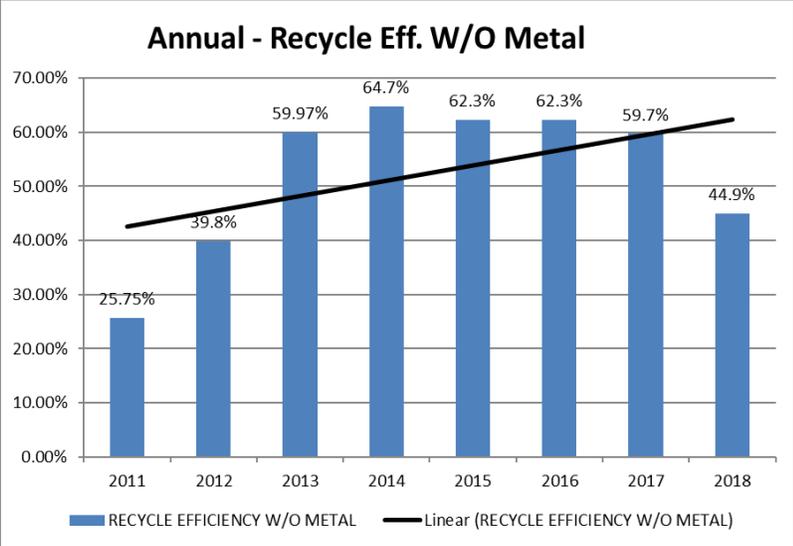
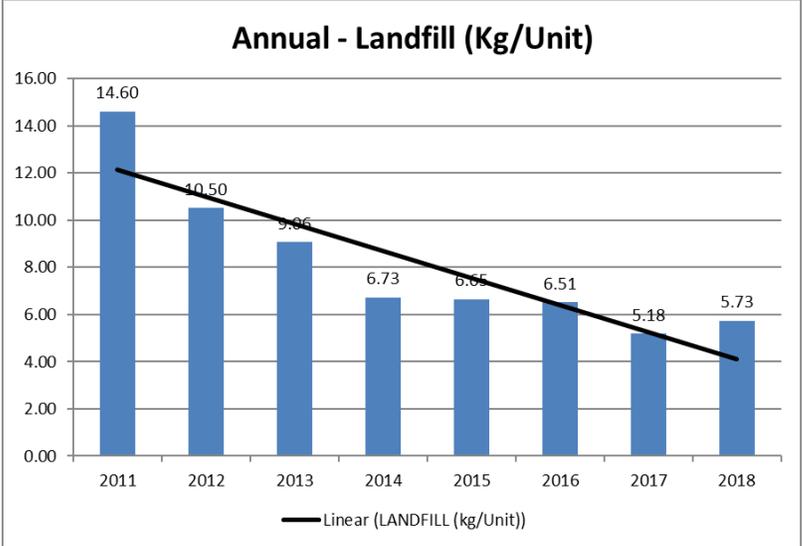
We develop & produce the heart of the vehicle, blending powertrain engineering & innovation with lean manufacturing & automation.



**Volvo Group Trucks**  
Mark Pannell  
Environmental & Energy Manager



**A major trend of companies for years has been to focus and grade their Environmental performance based on two related Key Performance Indicators.**



**They do so by assigning Key Performance Indicators to each of these and tracking related to an equivalent unit based on what they produce or simply as a percentage.**

**As a result they position their Environmental programs to chase trend lines on both KPI's.**

**Most times they focus on how to replace materials that are currently in the Landfill column so they appear in the Recycle column.**

# Landfill – Recycling KPI Modification

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**Two critical facts you need to understand with respect to our waste and recycling programs are:**

- **If it came through our gates, we paid for it.**
- **If it left through our gates, and was not an Engine, Transmission, Axle we paid for it again.**

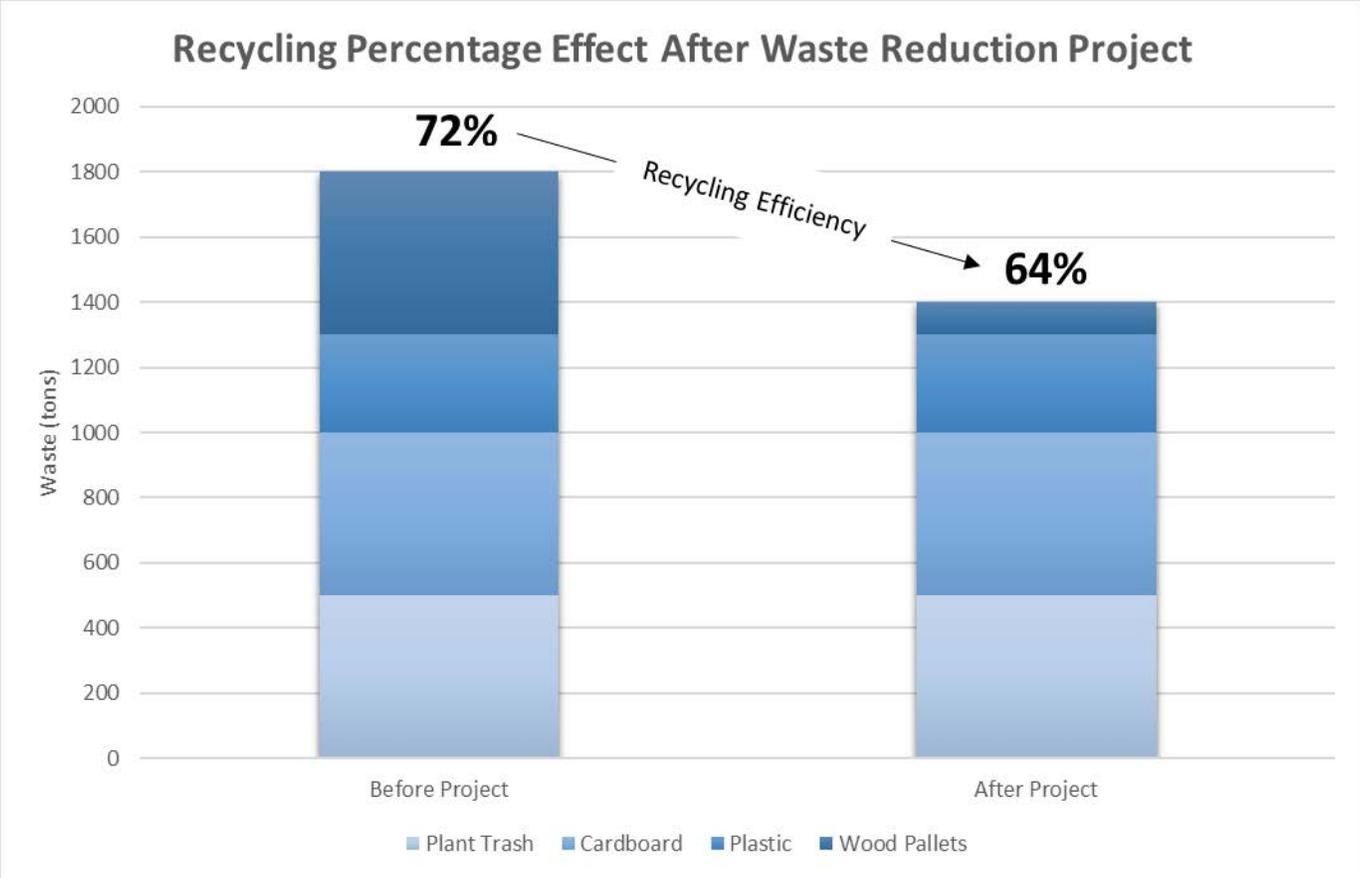
**We must focus on reducing the amount of material that is brought into this facility that will ultimately be sent back out as a waste or recyclable item. In the end it is not as critical where these items go, but rather that they were purchased and ultimately have no value to us anymore.**

For example a project that reuses a pallet or replaces a pallet with a returnable container will negatively effect our Recycling KPI.

Before the project the part we purchased came with a pallet and it would have been recycled and reflected in our overall recycling numbers.

Once the pallet is reused or a returnable container is implemented, the tonnage of pallets recycled is decreased and overall recycling tonnage is lower compared to the plant trash tonnage.

Effectively doing the right thing hurts how we have graded ourselves in the past.



## WE USED TO:

- Receive 13L block pallets produced by our supplier, Linamar.
- Receive 11L block pallets produced by Skövde, our sister plant.
- Recycle 11 & 13L block pallets after one-time use.



## NOW WE:

- Continue to receive 11L block pallets produced by Skövde.
- Unload the 11L pallets and send them to our 13L block supplier, Linamar.
- Linamar loads the 11L pallets with their 13L blocks and sends them back to us.
- Assess the pallet for re-use.
- If safe, we send the pallet back to Linamar for another 13L block.
- Otherwise, the pallet is sent to chip room for recycling.
- 13L block pallet production has stopped at Linamar.\*



SKÖVDE SENDS LOADED 11L BLOCKS TO HAGERSTOWN



11L BLOCK PALLET SENT TO LINAMAR

LINAMAR LOADS WITH 13L BLOCKS & SENDS BACK TO HAGERSTOWN



YES

NO

SENT TO CHIP ROOM FOR RECYCLING

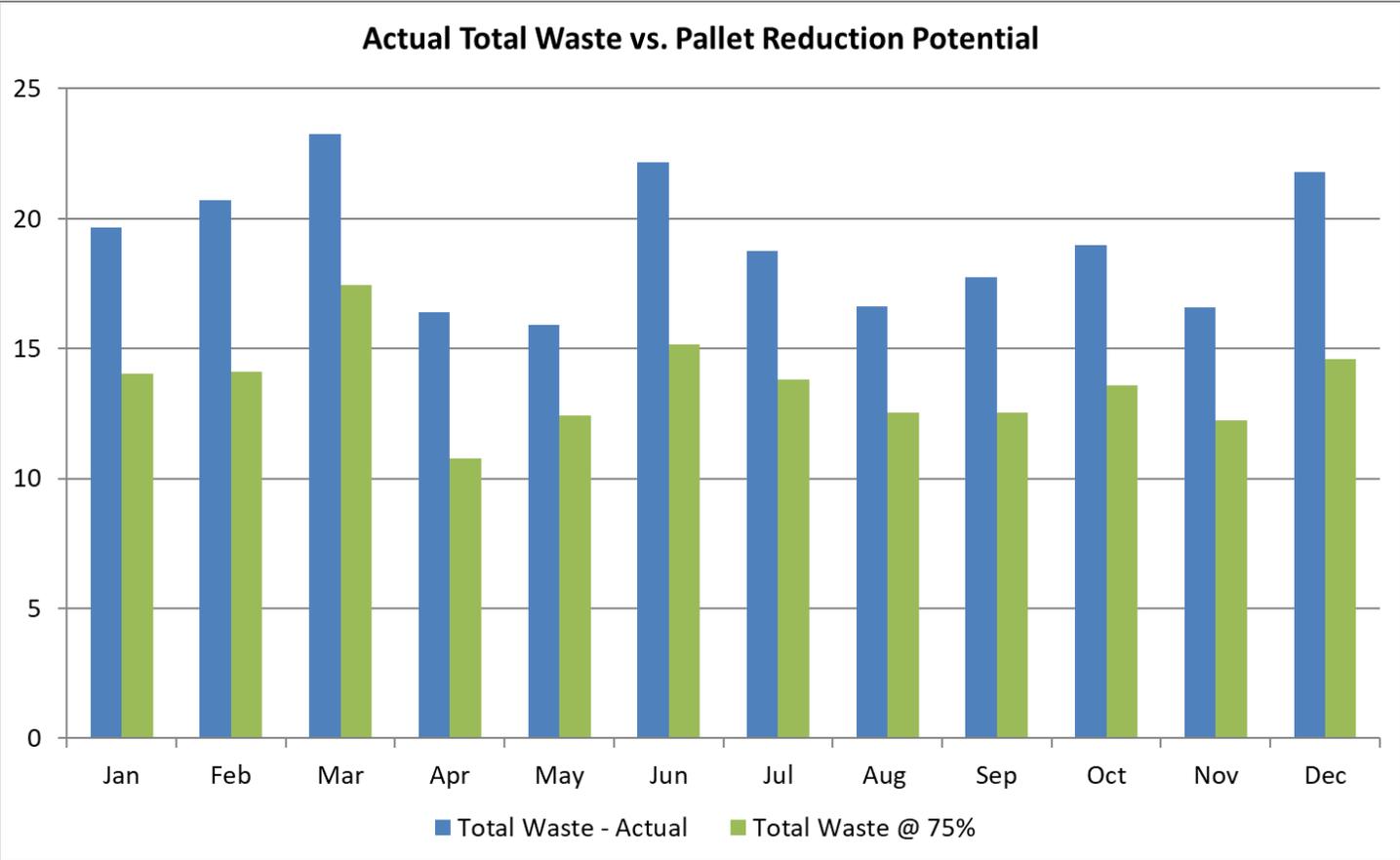
\*Tests were conducted to validate that the 11L pallets are safe to use for 13L engine blocks.

It is just as important to track the overall cost of the recycling streams as well. This is the Residual Cost of Production and is often missed when calculating cost per unit. This ensures you are focusing on the most cost effective method of managing or replacing the material. Many times this can be what pushes your project into a positive B/C ratio.

**Your Pallet Recycling Program:**

- 702 Tons Recycled (1,404,000 lbs.)
- Approximately 28,000 pallets (based on 50# pallet)
- Average cost of \$50.00 per pallet
- How much would you need to spend to achieve your 28,000 pallets to make your recycling numbers?

**\$1,400,000.00**



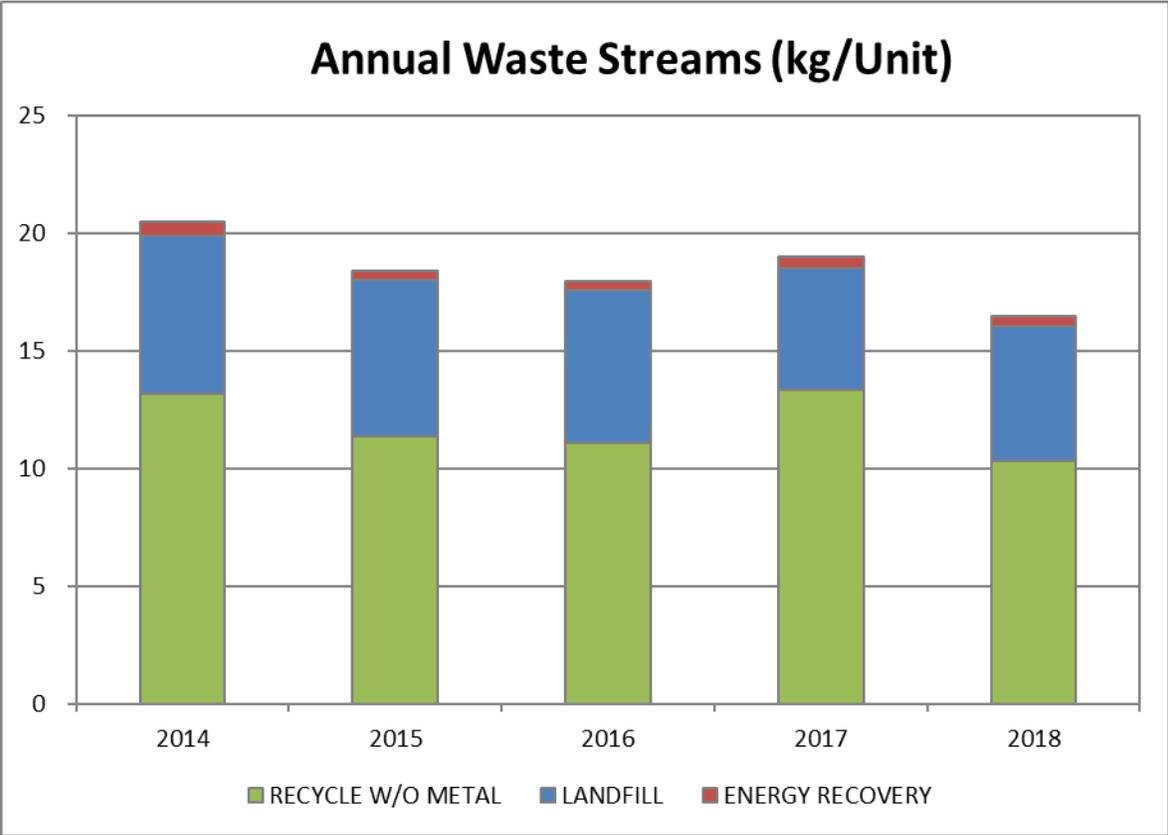
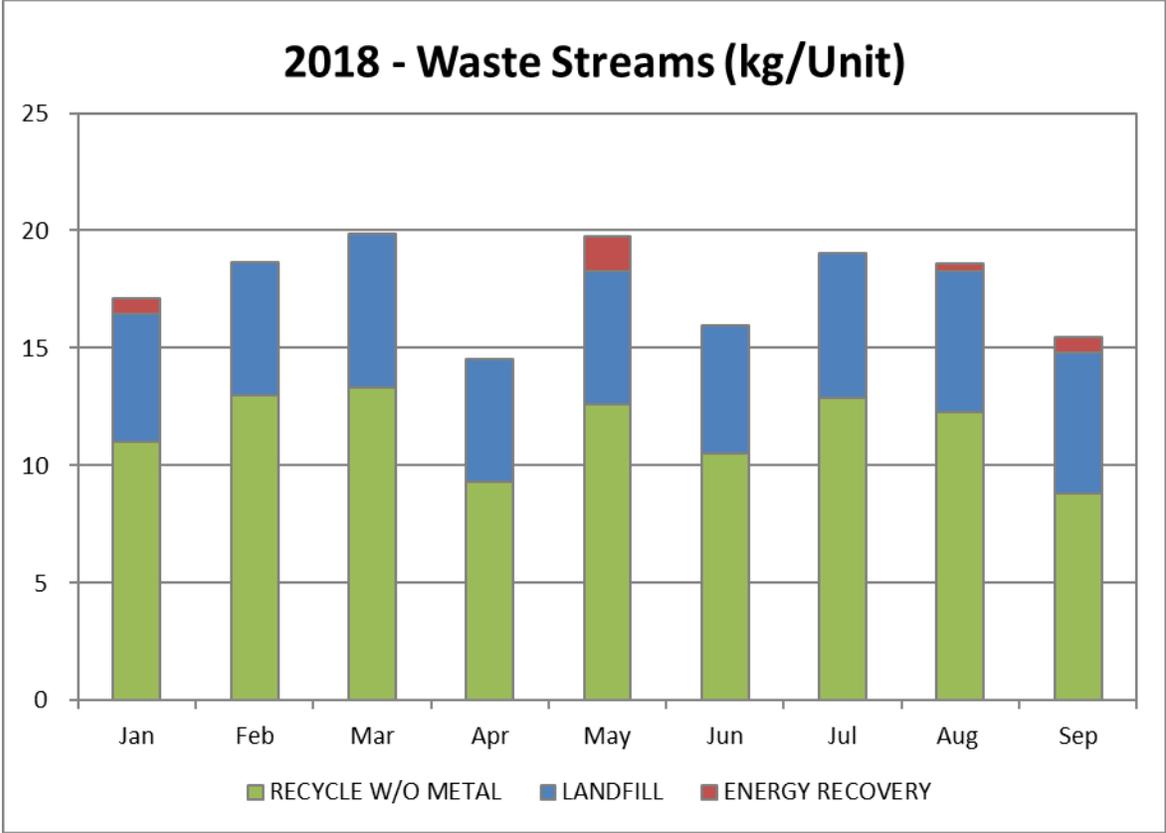
# “But I make money on my recycling!”

## Your Cardboard Recycling Program:

- 465.83 Tons (931,660 lbs.)
- Rebates of \$62,699.65 (average rebate of \$95/ton)
- Based on one of the cheapest pieces of Cardboard we purchase for use in production (\$.44 each) we would need to purchase \_\_\_\_\_ worth of this Cardboard to achieve the above rebate amount.
- We receive at best 1/25<sup>th</sup> the value of what we purchase in rebates.



**Moving forward we have combined our Landfill and Recycling KPI to reflect the total amount of material/waste that is leaving this facility after producing our products.**



**This allows us to see the benefit of any projects that reduce that volume whether it be from the recycling side or the waste side.**

# Key Points For Your Leadership Team To Discuss

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- **If it came into your facility, you paid for it, including the packaging.**

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- **If it left your facility and did not go to your customer you paid for it again.**

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- **Are we chasing trend lines?**

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- **Are we engaged at step one with our Buyers and Purchasing Teams, or do we try and solve it later?**

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- **Do we have the internal competence we need to attack these items?**

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- **Are we as Leadership willing to commit to action and provide the resources.**

# Thank You.

[volvogroup.com/hagerstown](http://volvogroup.com/hagerstown)

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