

# **Zero Waste to Landfill Initiative at Ford Motor Company**



***Presented by:  
Tim Buisch  
Environmental Quality Office  
Ford Motor Company  
Air and Waste Management Association  
December 1<sup>st</sup>, 2016***

# Ford's Vision

MAKING PEOPLE'S LIVES BETTER



Ford's vision is people working together as a lean, global enterprise to make people's lives better through automotive and mobility leadership.

# Ford's Sustainability Vision

Our vision for the 21<sup>st</sup> century is to provide  
SUSTAINABLE transportation that is  
affordable in every sense of the word:

*Environmentally, Socially &  
Economically*



“Improved sustainable performance is not just a  
requirement, but a tremendous business opportunity.”

- *Bill Ford*

# Manufacturing Environmental Strategic Direction

Adopt holistic approach to reducing overall environmental impact of manufacturing operations:

Pursue integrated air emissions control approach that also reduces greenhouse gas emissions and improves energy efficiency.

Take resource conservation actions specifically toward eliminating land disposal and reducing water usage.

Evaluate and reduce toxicity of manufacturing byproducts (e.g., air emissions, wastewater, waste) in addition to quantity.

# Overview

- Today I'd like to discuss the Zero Waste to Landfill Initiative (ZWTLF) at Ford Motor Company.
- The topics will include:
  - Why ZWTLF?
    - Waste Management Hierarchy
    - Ford ZWTLF Manufacturing Facilities
  - Implementation
    - Obtain Management Support
    - Develop Accurate Metrics
    - Define ZWTLF
    - Develop and Communicate ZWTLF Goals
    - Develop a "Top 5" Priority List
    - Develop, Implement and Share ZWTLF Actions
    - Share your Successes
  - ZWTLF Challenges

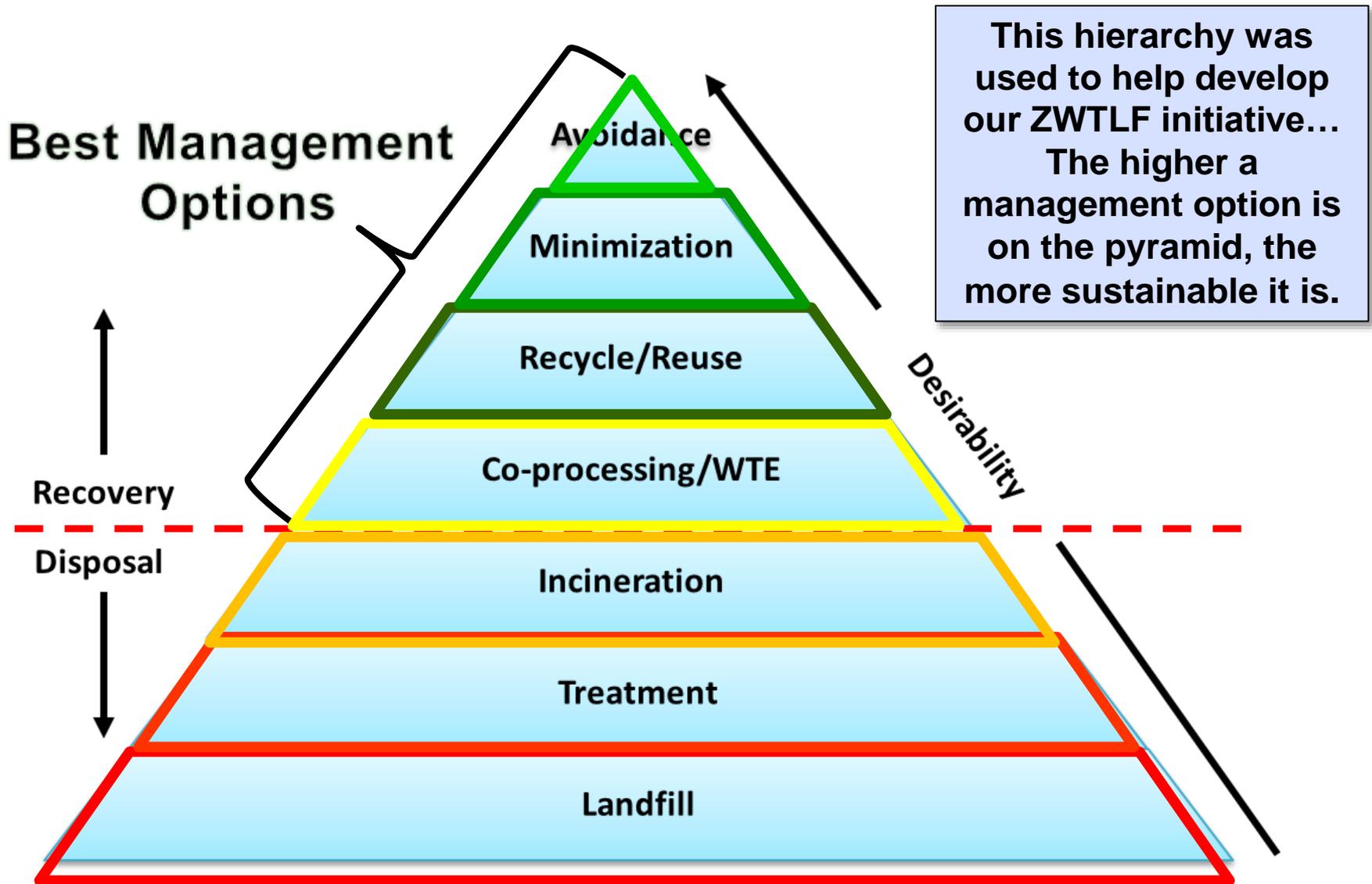


# Why ZWTLF?

- In addition to using valuable land resources, landfills may create pollution in the environment by potentially contaminating the groundwater, aquifers, and soils.
  - Landfills also produce methane gas which is a greenhouse gas twenty one times more powerful than carbon dioxide
  - Landfilled materials may also trigger retroactive CERCLA liability
  - Ford is currently expending significant resources on remediation, which would have been avoided if waste had not been sent to landfill.
- As noted on a previous slide, Ford has adopted a holistic approach to reducing the overall environmental impact of manufacturing operations which includes:
  - Taking resource conservation actions specifically toward eliminating land disposal of waste and reducing water usage
  - Achieving ZWTLF is one key component of Ford's Sustainability Initiatives



# Waste Management Hierarchy



# ZWTLF Ford Manufacturing Facilities

## 2012

- Chennai Engine
- Cologne Engine
- Essex Engine
- Cologne Die Cast
- Cologne Cotarko
- Chennai Assembly
- Cologne Assembly
- Saarlouis Assembly
- Van Dyke Transmission

## 2013

- FTM (Thailand)
- Windsor Engine
- Bordeaux Transmission
- JMC Xiaolan
- Rawsonville Components

## 2014

- Oakville Assembly Complex
- Taubate Transmission
- Camacari Engine
- Cuautitlan Assembly
- Chihuahua Engine 1 & 2
- Taubate Engine
- Lio Ho Assembly

## 2015

- Valencia Engine
- Hermosillo Assembly
- Chongqing Transmission Plant
- Chongqing Engine Plant
- Bridgend Engine
- Dagenham Engine

## 2016

- Auto Alliance Thailand
- Ford Vietnam Limited
- Valencia Assembly
- CAF Hangzhou Assembly
- Craiova Engine
- Craiova Assembly
- Sao Bernardo Assembly
- Sanand Assembly
- Sanand Engine Plant
- Dearborn Truck
- Dearborn Engine Plant
- Dearborn Tool and Die
- Dearborn Stamping
- Dearborn Diversified Manufacturing

**Currently there are 41 ZWTLF Manufacturing Facilities**

**\* 74 total ZWTLF Facilities**



# Implementation

- The next few slides illustrate how Ford has implemented our ZWTLF initiative.
- Please keep in mind that ZWTLF usually requires a significant change in corporate culture.
  - Need to transform the “just throw it away into the trash” mentality
- ZWTLF is a journey and not a one-time event.
  - Affecting real change takes time and persistence
- Recognize there may be site-specific issues that may provide barriers to ZWTLF implementation.
- ZWTLF is a true **cross-functional team** effort...it will **not** succeed if it is driven only by Environmental Engineering.



# Obtain Management Support

- It is critical to obtain top management support for your ZWTFLF goals and action plans.
- As mentioned before, ZWTFLF is not a “bottom up” driven program but must be driven from above:
  - Resources will need to be expended, even if it’s just the time commitment to organize and support a ZWTFLF Team
    - There may need to be changes to the facility infrastructure to facilitate ZWTFLF
    - Changes in facility layout may need to be affected
    - New equipment such as compactors, balers, and specialized gondolas may need to be purchased
- Without top management support, your ZWTFLF initiative will struggle to achieve its targets and objectives.



# Develop Accurate Metrics

- It is **critical** that accurate metrics need to be developed before beginning a ZWTLF initiative.
- Without accurate metrics and robust databases, it is very difficult to assess your progress in achieving ZWTLF.
  - Your metrics will be the basis of updating management regarding the status of your program
- Metrics must be comprehensive, uniform, and accommodate all wastes generated by the enterprise.
- At a minimum, metrics should include:
  - The amount of waste being diverted from landfill
  - A description of the waste, including if it's hazardous or non-hazardous



The disposition and volumes of all generated wastes

# Define ZWTLF

- There is **no** standard definition of ZWTLF.
  - It is important to gain consensus of your definitions from all stakeholders before beginning the program
- Some definitions of ZWTLF include a minimum percentage of waste that is diverted from landfill, such as 90% diversion, don't include landfilled waste generated from off-site Material Recovery Facilities (MRF), or only track certain waste streams.
- You also need to define what materials will be excluded from the definition of landfilled wastes such as construction and demolition wastes.
- Ford defines Zero Waste to Landfill facilities as not landfilling **any** manufacturing wastes...true ZWTLF.



# Develop and Communicate ZWTLF Goals

- The first step in implementing a ZWTLF initiative is to develop specific goals for your program:
  - Corporate goals and;
  - Facility-specific goals
- Establish aggressive short, intermediate, and long term goals to eliminate waste being disposed in a landfill, including percentage reduction goals as well as dates for accomplishing the goals.
- Establish both waste minimization and reducing waste-to-landfill goals.
  - Remember the Waste Management Hierarchy pyramid?
- The goals should be measurable, achievable, ambitious, and phased in over a specified time.

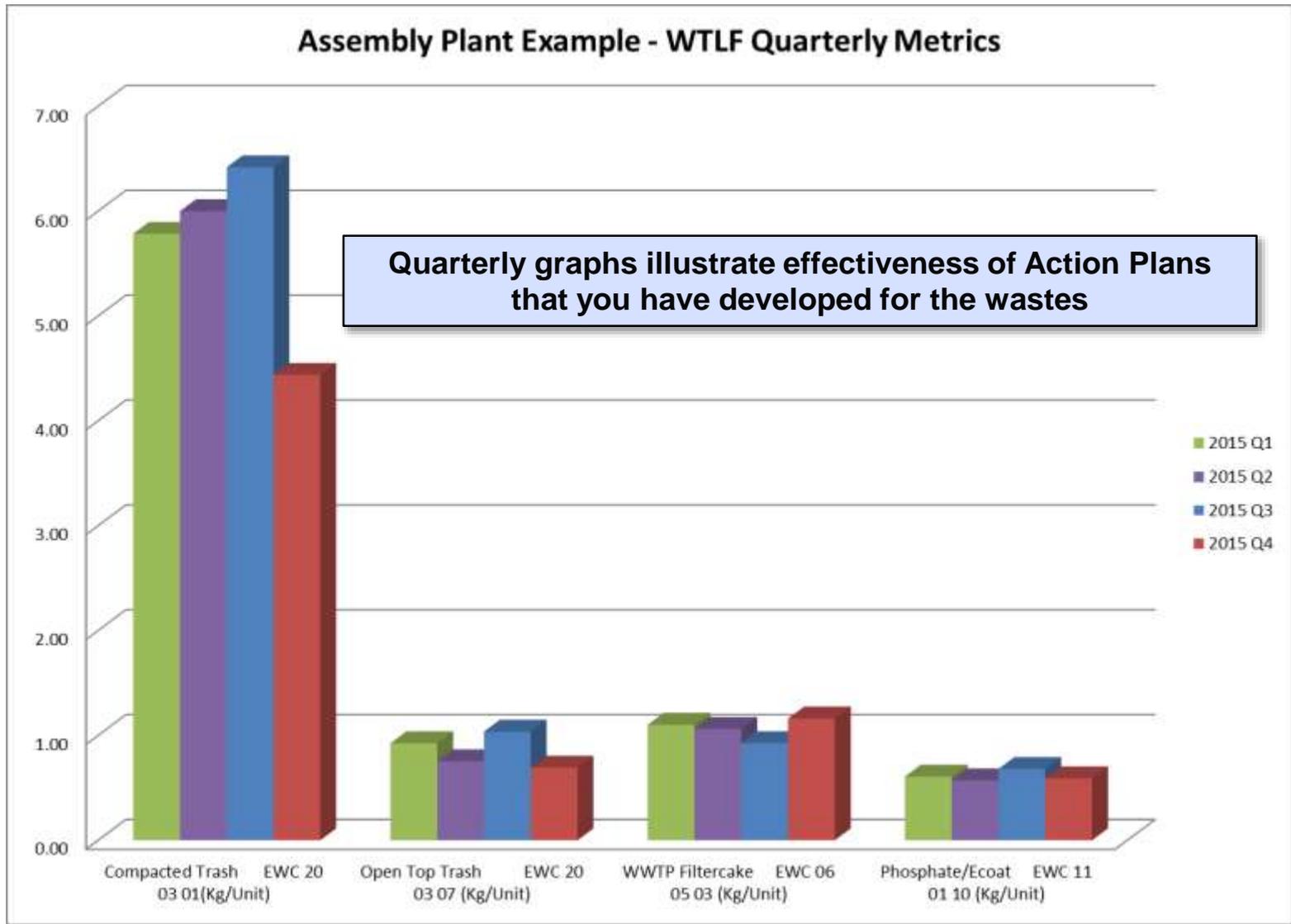


# Develop a “Top 5” Priority List

- It can sometimes be overwhelming to try to establish nonlandfill management methods for all landfilled waste streams at once.
- One successful approach has been to develop a “Top Five” list identifying the “Top 5” WTLF streams at each facility.
- The “Top 5” list of wastes may be based upon:
  - Volume
  - Cost
  - Toxicity
  - Hazardous classification
- This approach allows both initial progress and future successes to be tracked.
  - Recommend tracking progress at least on a quarterly basis
- Once the initial “Top 5” wastes have been addressed, develop and address the next “Top 5” list of landfilled wastes.



# “Top Five” WTLF Streams - Graphs



# Implementing ZWTLF Actions

- Use of local Waste-to-Energy facilities to manage facility trash.
- Maximize the amount of expendable packaging recycling.
- Improve waste sorting procedures to make recycling and reuse easier.



# Implementing ZWTLF Actions

- Invest in new technologies that minimize waste, such as dry-machining.
- Optimize in-plant recycling facilities (balers, increase trash dock area, etc.).
- Eliminate contamination of recyclables.
- Develop cafeteria waste composting programs.



# Implementing ZWTLF Actions

- Optimize chemical additives to reduce waste volumes (WWTP sludge, etc.).
- Investigate alternative non-expendable packaging options.
- Improve housekeeping and material handling processes.



# Implementing ZWTLF Actions

- Conduct “dumpster dive” audits.
- Develop an awareness and training program for personnel (corporate and plant) that affect the management of waste.
- Conduct “waste walks” at a set frequency.
- It is important to periodically review your action plans to ensure they are effective and are working to achieve your goals.



# Share ZWTFL Actions

- When effective ZWTFL actions have been developed, they need to be shared with other facilities so they can assess whether they can be implemented on a site-by-site basis.
- There are several ways that these actions can be shared and centrally coordinated:
  - Development of a ZWTFL action list (global opportunities list)
  - Development of a ZWTFL internal web site or shared drive
  - Use of newsletters or other internal publications
  - Other internal resources (safety talks, awareness campaigns)
- It is critical whatever method is used to share information, it is periodically reviewed and updated when needed.
  - This type of information may become quickly out of date



# Share Your Successes

- Once you begin your ZWTFLF initiative, it's important to share your successes both internally and externally.
  - This encourages further ZWTFLF efforts
  - Also gives recognition to everyone who contributed to the success of the program
- Successes should be shared both internally and externally:
  - Internally
    - Plant level
    - Corporate level
    - Discussed in Management meetings
  - Externally
    - Corporate website
    - Annual sustainability report



# Internal Example

This type of information may be posted to your facility web site, printed and posted throughout the facility, or used in a facility newsletter...

It is a very effective technique to share the successes of reducing waste-to-landfill and increasing recycling...

The Assembly Plant uses three-wet paint technology to meet the annual fresh water needs of 777 individuals.

thereby conserving natural resources.

Waste disposal needs for a community of 27,394 individuals for one year.

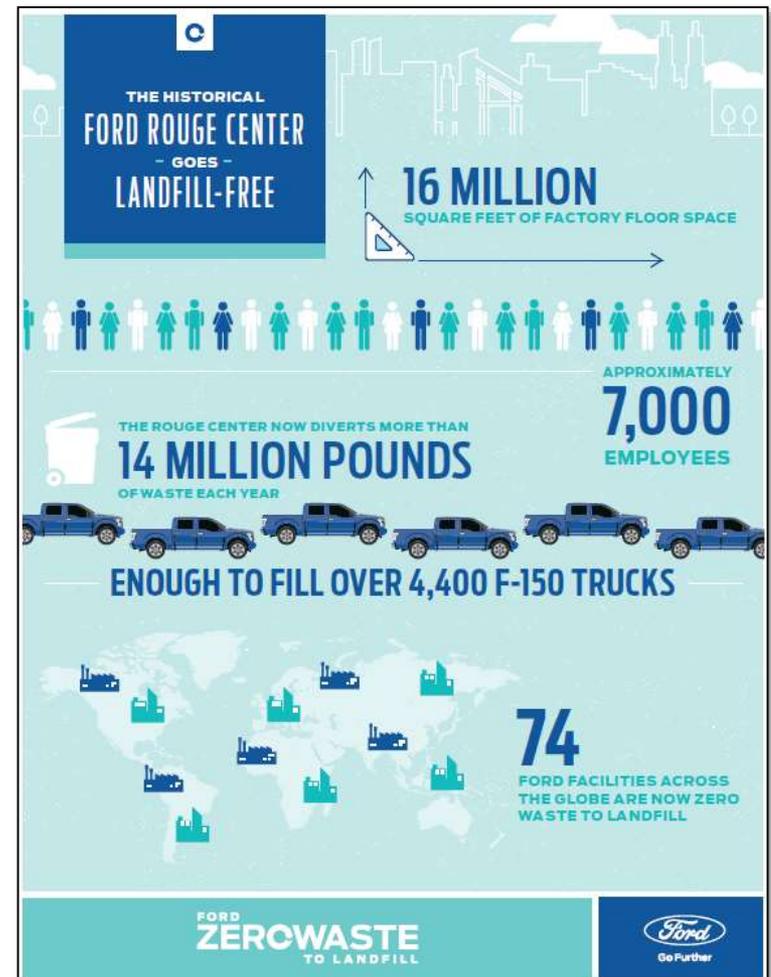
## DID YOU KNOW...

Ford Assembly Plant uses the three-wet high-solids solvent-borne paint technology. This process allows the three layers of paint - primer, base coat, and clear coat - to be applied while each layer is still wet. Three-wet can reduce carbon dioxide emissions by 15-25 percent and Volatile Organic Compound (VOC) emissions by 10 percent compared to either conventional high-solids solvent-borne or waterborne systems.



# External Example

- Here are two examples of information used to share ZWTLF successes to external parties:



# ZWTLF Challenges

- In many cases, a non-landfill waste management option has increased costs associated with it.
  - This is primarily because of increased transportation costs due to the lack of local ZWTLF waste management facilities
- Globally, ZWTLF resources may not be always available due to changes in regulations or operational issues at the waste management facility.
  - Always ensure alternate ZWTLF resources are available
- Waste management metrics must be periodically reviewed to ensure they are both accurate and uniform.
  - If your metrics are not accurate, you will not be able to determine the status of your ZWTLF initiative
- At a minimum both an implementation and upper management champion should be identified
- Physical changes to plants may be required and new equipment may need to be purchased.



# Summary of a Successful ZWTFL Initiative

- Obtain Management Support
- Develop and Maintain Accurate Metrics
- Define ZWTFL
- Develop and Communicate ZWTFL Goals
- Develop a “Top 5” Landfilled Waste Priority List
- Develop, Implement and Share ZWTFL Actions
- Share your Successes
- Recognize and Overcome Challenges



# Why is Ford doing this?

- Strategic direction to eliminate land disposal
- Avoiding the creation of legacy sites
- Eliminating cost and risk
- Ford's stakeholders (customers, employees, investors) expect it.



# Thank You

