

# 5 Year Continuous Improvement

## Toyota Motor Manufacturing, Indiana, Inc.



CARBON



WATER



MATERIALS



BIODIVERSITY



# TMMI Information

- 2 Assembly plants under 1 roof

## West Plant (1998)

- Sequoia
- Highlander
- Hybrid Highlander



## East Plant (2003)

- Sienna
- Highlander

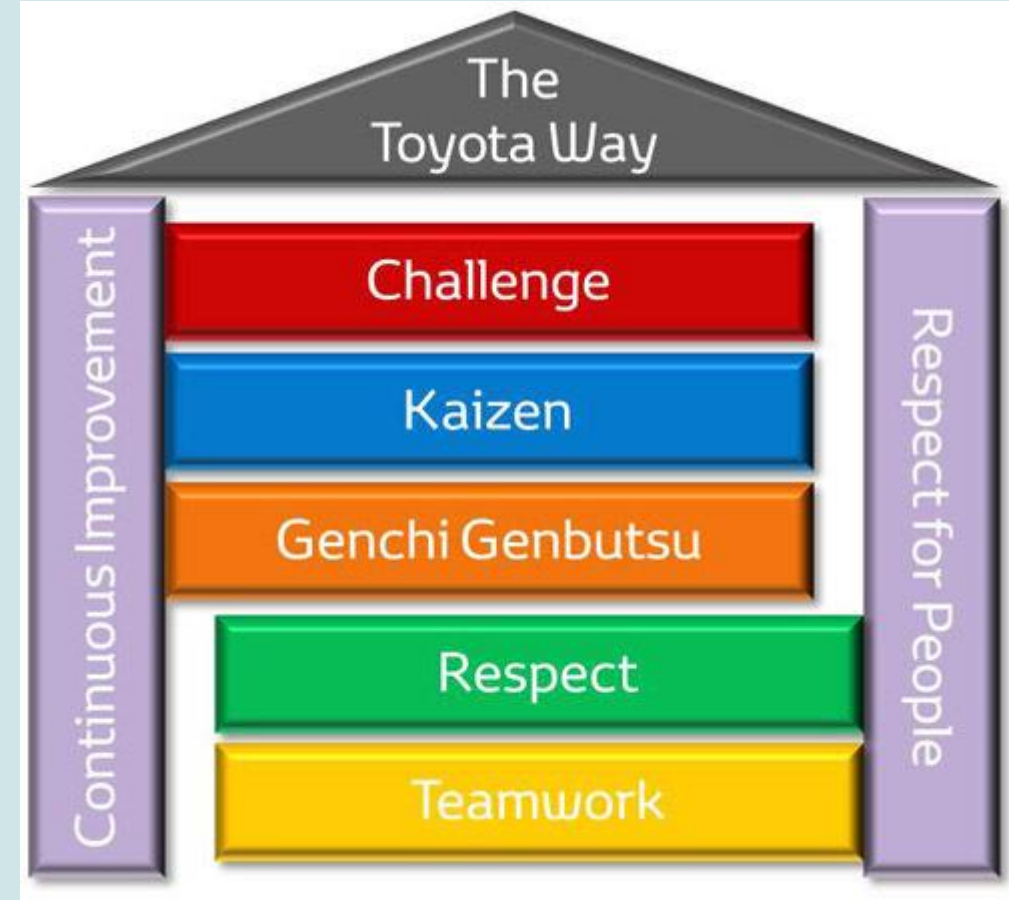


- 2,000,000 square feet under roof
- >4,700 team members
- ISO14001
- ISO9001



# Kaizen: Culture vs Process

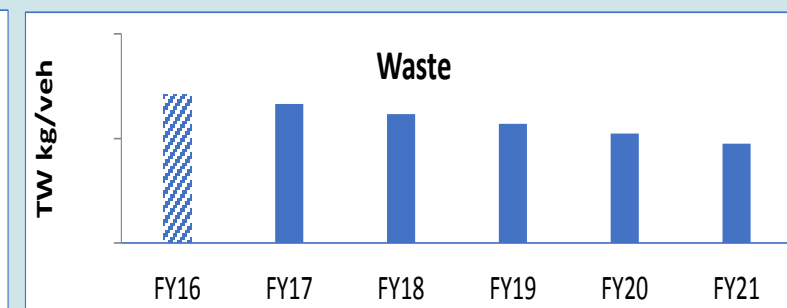
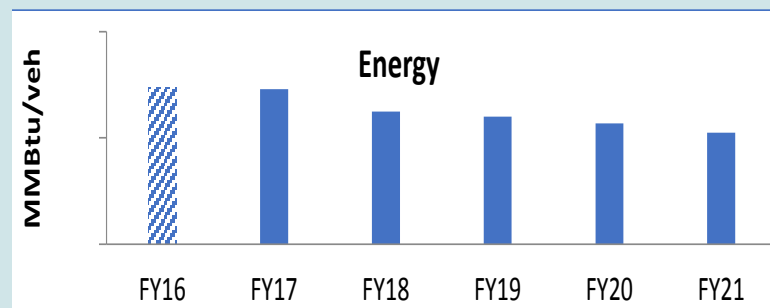
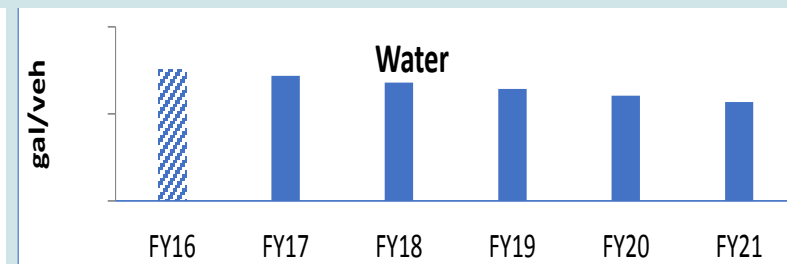
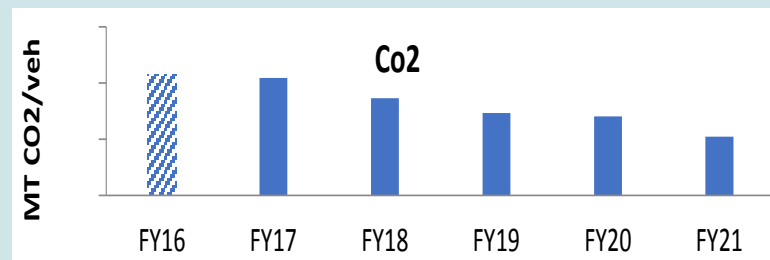
- Kaizen = “Improvement”  
(kai = Change; zen = good)
- All Team Members Empowered
- Compounding Return



# Long Term Targets

- Five Year Action Plan
  - Energy
  - Water
  - Air Emissions
  - Waste

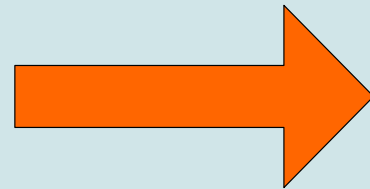
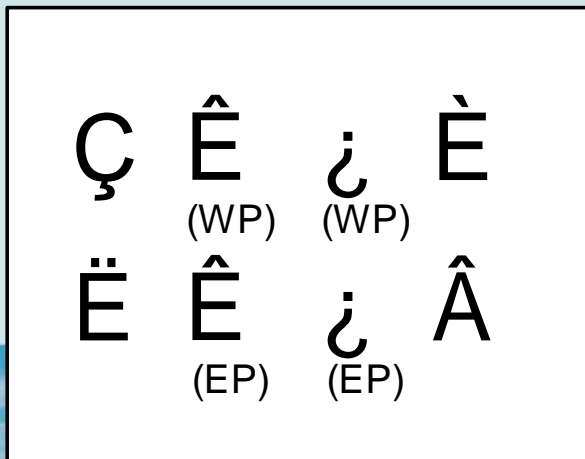
Ex. “5% Reduction over 5 years”



# Yearly Performance Management

- Develop Environmental Action Plans
  - TMMI
  - Shop Specific
- TMMI EAP based on shop EAP's

## Shop EAP's



## TMMI's EAP



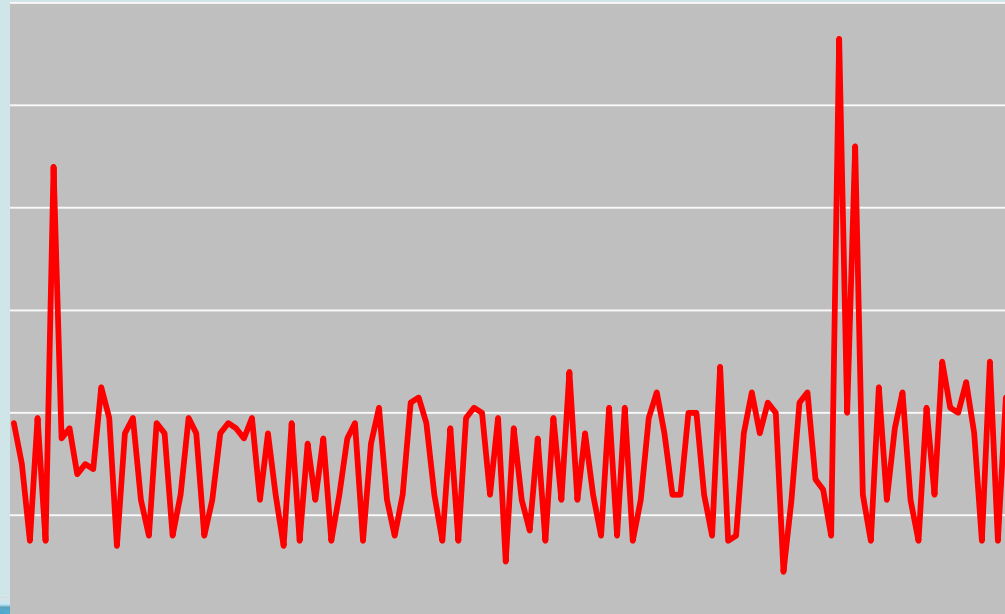
Total Plant Target





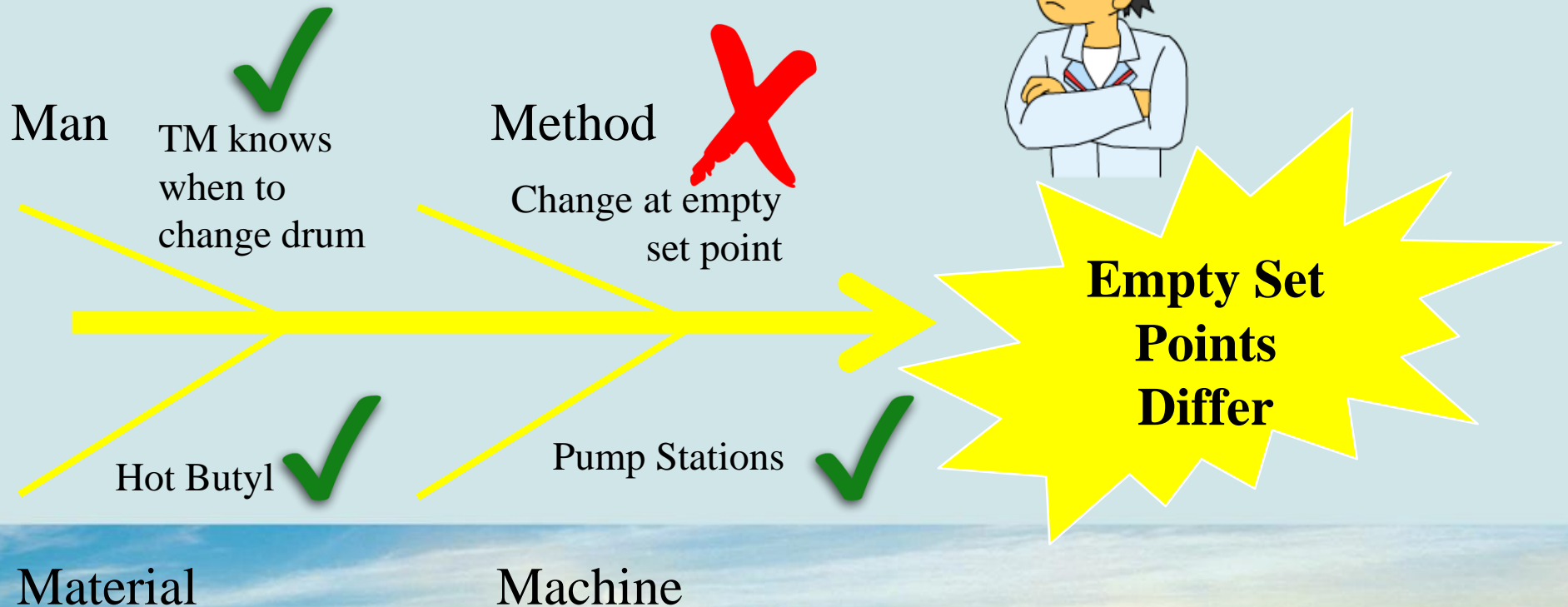
# Project Example #1: Hot Butyl Savings

- While reviewing waste drum data, ENV notices that the weight of the empty material drums varied
- Disposing of good raw material!!!

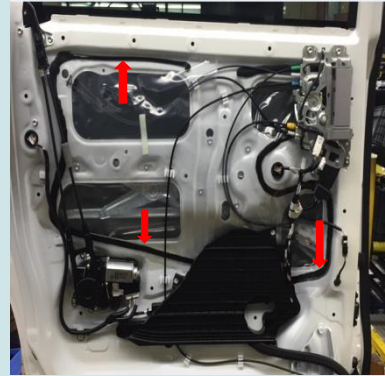


# Project Example #1: Hot Butyl Savings

What is different between West Body Assembly and East Body Assembly???



# Project Example #1: Hot Butyl Savings



Raw Material  
Placed on Pump

Material  
Applied

Material Drum is Empty  
(Point of Occurrence)

Raw Material  
Drum replaced



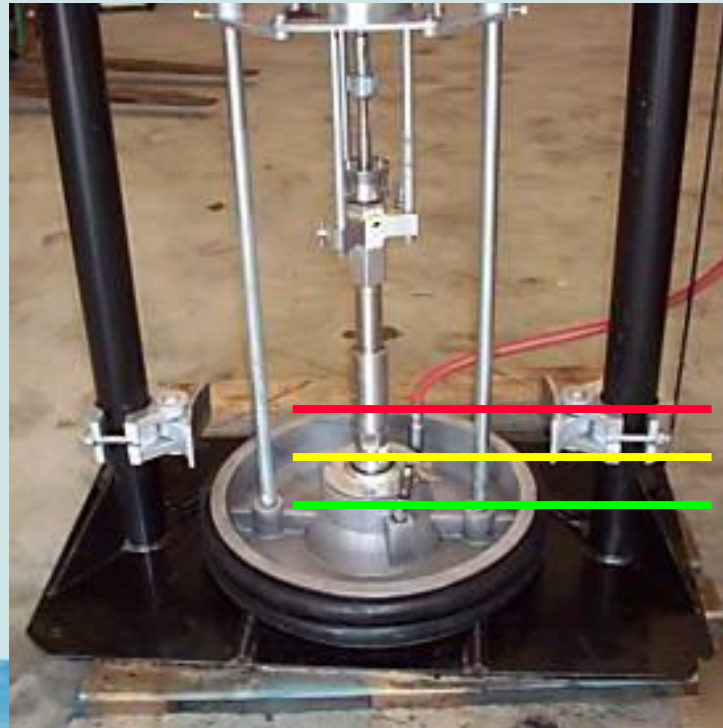
Sensor indicates empty  
drum, triggers replacement





# Project Example #1: Hot Butyl Savings

- 2 Phase Countermeasure
  - Phase 1 – Equalize
  - Phase 2 - Improve



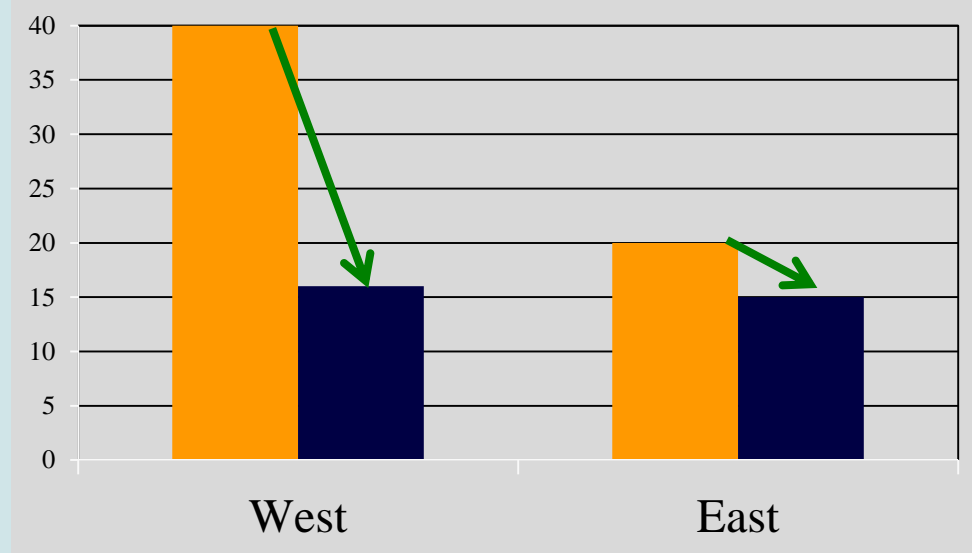
West Empty Set Point

East Empty Set Point

New Empty Set Point

Make  
SAME  
Make  
BETTER

# Project Example #1: Hot Butyl Savings



**Set Point  
Lowered 3  
inches!**



Over 22,000# of Raw Material Savings /year!!!

Raw Material Savings	\$ 45,608
Waste Disposal Savings	\$ 6,420
<b>Total Yearly Savings</b>	<b>\$ 52,028</b>

Zero Cost to implement



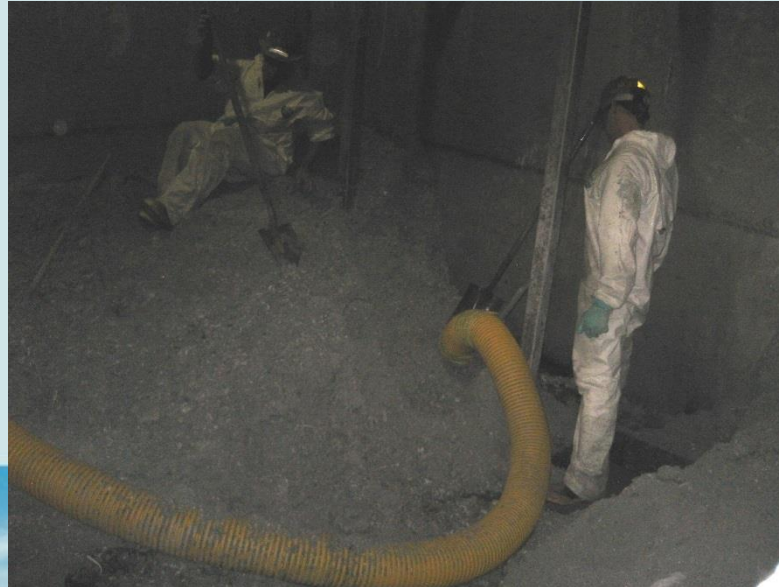
# Project Example #2: Sludge Dewatering





## Project Example #2: Sludge Dewatering

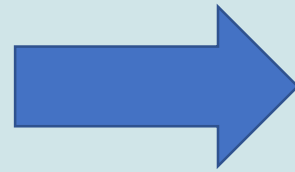
- Paint sludge tank must be cleaned out every few years
  - TMMI has multiple sludge tanks, at least one cleaned each year
- Cleaning requires manual removal of sludge
- Paint sludge is sent to Waste to Energy for disposal





## Project Example #2: Sludge Dewatering

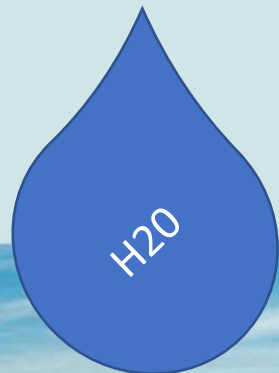
- Sludge system waste a slurry, mix of sludge and water
- Slurry shipped to Waste To Energy for disposal, High Water



**\$\$ To Ship and  
Burn Water**

## Project Example #2: Sludge Dewatering

- TMMI Currently paying to ship and dispose of water in sludge, reducing water will = cost savings
- Less water in sludge = more sludge per box = less shipments = cost savings
  - Each shipment costs approx. \$1000 in transportation

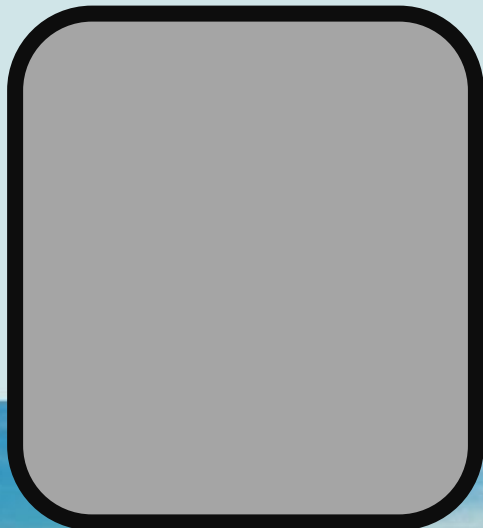


Wasted \$\$

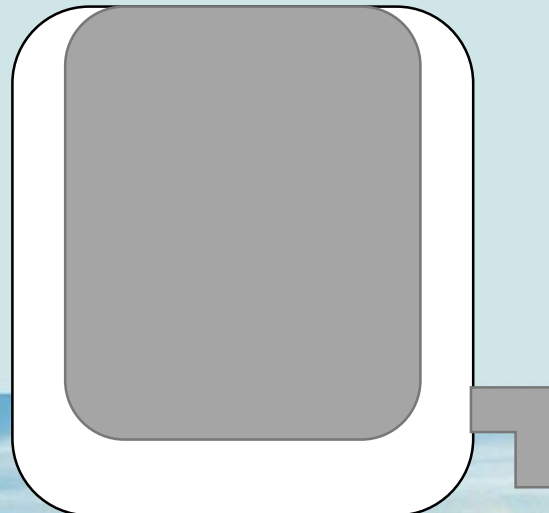
## Project Example #2: Sludge Dewatering

- Use New vac box with false bottom and filter that allows water to be removed during cleaning process

OLD STYLE = Water  
stays with Sludge

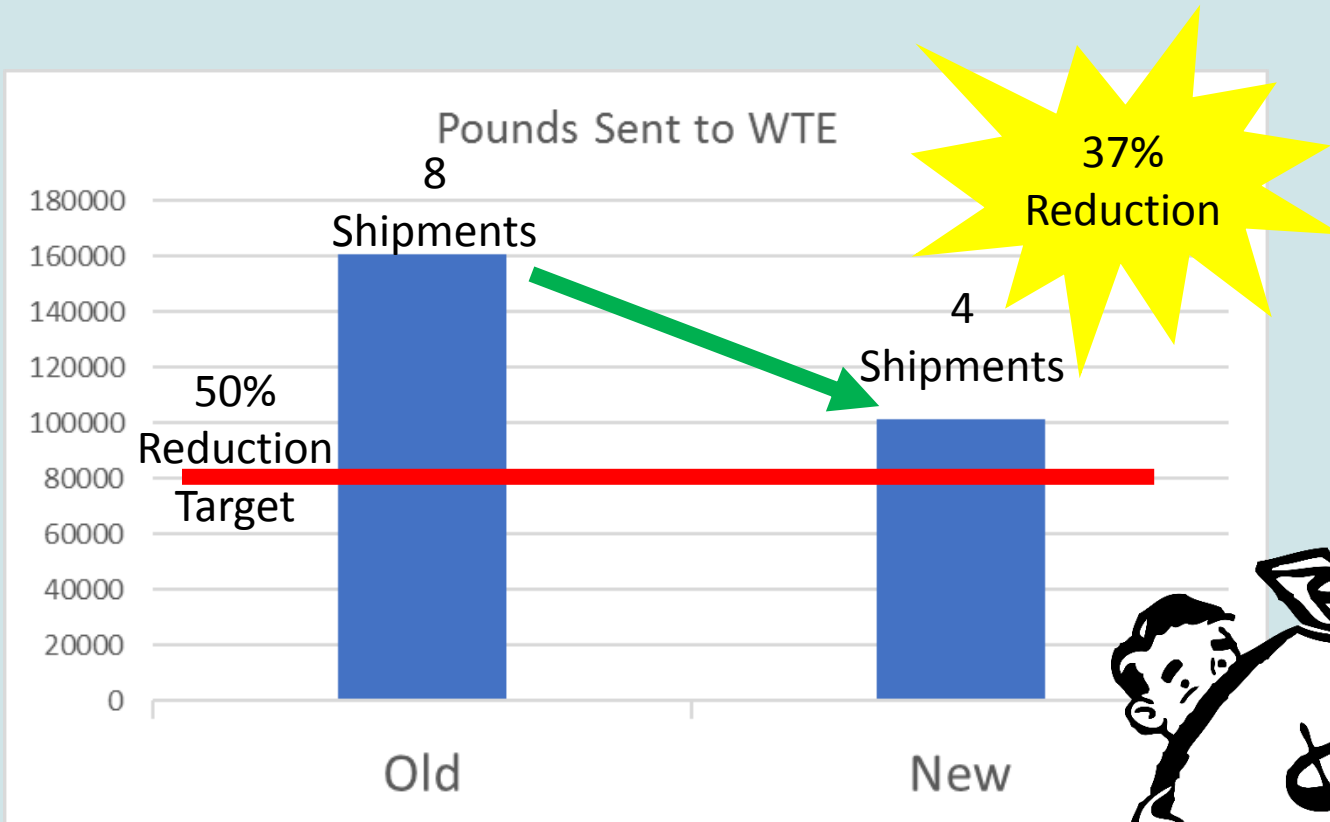


NEW STYLE = Water  
removed from sludge



Water  
Removed!

# Project Example #2: Sludge Dewatering



- 37% Reduction in total sent for disposal
- 8 shipments reduced to 4!
- Weight per box increased 25% (more sludge, less water)

Additional cost = \$2000  
(boxes + Operator)

Disposal Savings > \$11,000

**Total Savings > \$9000 per cleaning!!!**





TOYOTA

LET'S MAKE A BETTER PLANET



CARBON



WATER



MATERIALS



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ENVIRONMENTAL  
CHALLENGE 2050

