

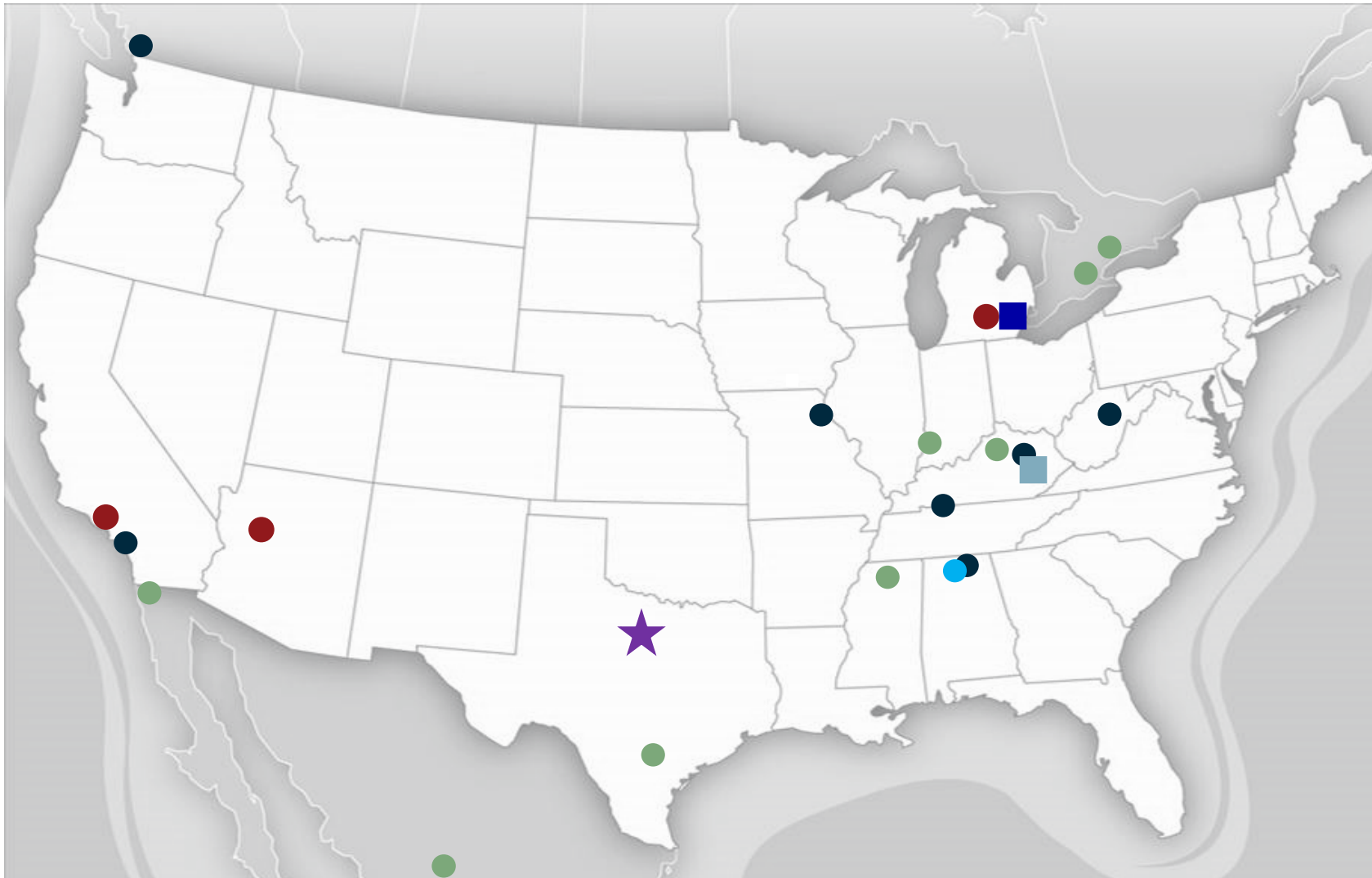


TOYOTA

2019 Better Buildings Summit

Better Practice – Toyota ESCO Process

Toyota North America Operations



- Vehicle Assembly (8)
- Unit Plant (7)
- Research & Development (3)
- Manufacturing Purchasing
- Production Engineering
Georgetown, KY
- ★ Corporate Headquarters
Plano, TX
- Toyota & Mazda Joint Venture
Huntsville, AL

29 Million Sq.Ft.

CARBON

CHALLENGE 1 

CHALLENGE 2 

TOYOTA ENVIRONMENTAL CHALLENGE 2050




CHALLENGE 3 

<http://www.toyota-global.com/sustainability/environment/challenge2050/>

WATER

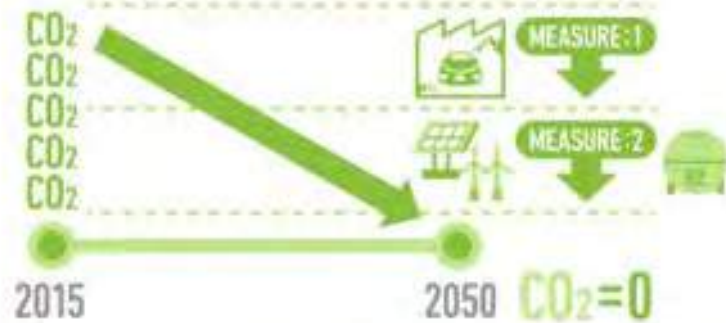
CHALLENGE 4 

MATERIALS

CHALLENGE 5 

BIODIVERSITY

CHALLENGE 6 



- Zero CO₂ emissions in all plants worldwide by 2050
- 2030 Milestone: Reduce CO₂ emissions from all plants worldwide by 35% from 2013 baseline

How? Innovative Technology, Renewable Energy and *Kaizen Activity

*ESCO supports the Kaizen Activity

What is the Energy Savings Collaboration (ESCO)?

Internal energy savings and minimization process

GOAL



- Identify/implement CO₂ reduction opportunities in manufacturing
- Support Toyota's 2050 Challenge
- No impact to – Safety, Quality and Production
- Team Member Development (management, production, maintenance, engineers, group leaders, contractors and students)
- Promote reduction activities in daily work

What's the difference?



ESCO

- Focus is on plant operations during “all times”
- One-to-two week, deep dive
- Walk throughs focus on:
 - High level and detailed inspection; processes, set points, startup/shutdown, human behaviors, ability to ask questions while plant is running, etc.

Treasure Hunt



- Focus is on plant operations when “sleeping”
- One-to-three day, quick fixes
- Walk throughs focus on:
 - High level inspection; equipment running, leaks, lights on, etc.

How does the ESCO Process work?

2 months
(Pre-ESCO)

A

PREPARATION

Study where to look:

- Data Analysis
- Evaluate KPIs
- Determine gaps
- Identify initial kaizens
- Create team

0 months

B

SITE INVESTIGATION

Genchi Genbutsu (go & see):

- Onsite 1-2 weeks
- Audit SEUs and processes
- Perform energy calculations
- Report findings to Plant Executives

+12 months
(Post-ESCO)

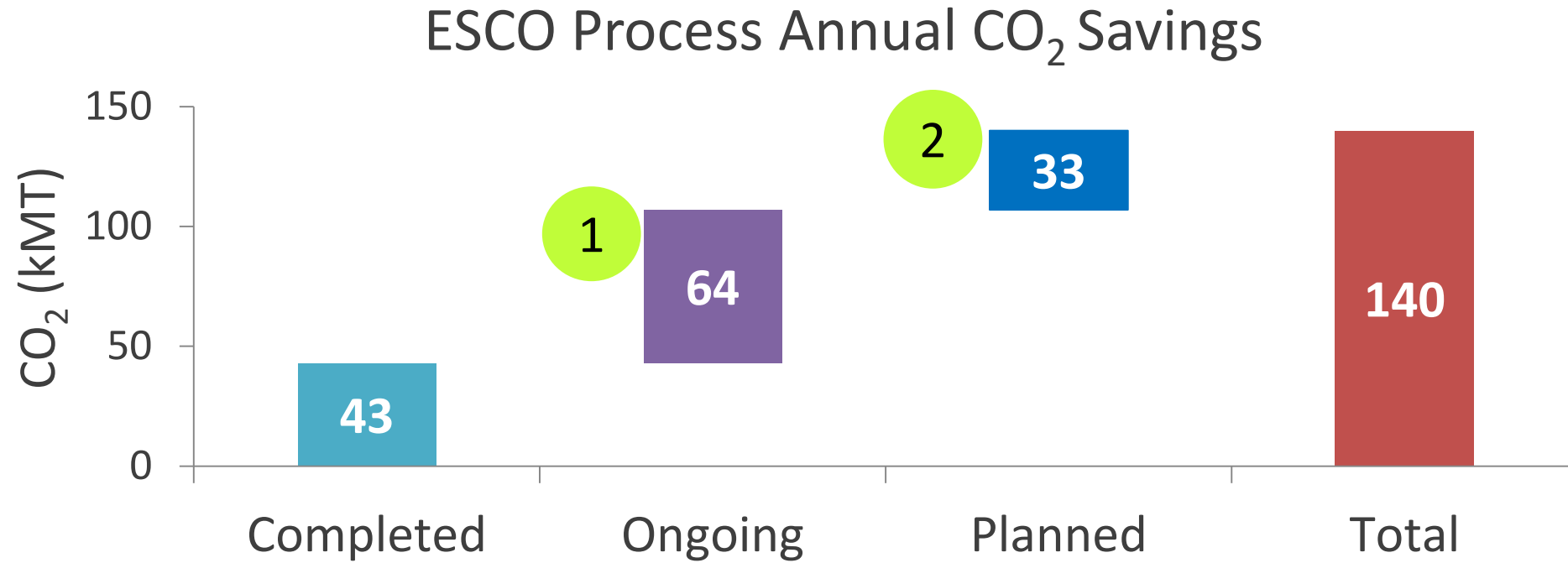
C

IMPLEMENT

Kaizens discussed:

- Low/no cost
- Confirm R&R
- Secure project funding
- Expect one year to implement
- Measure & verify
- Follow-up

Let's Talk Numbers

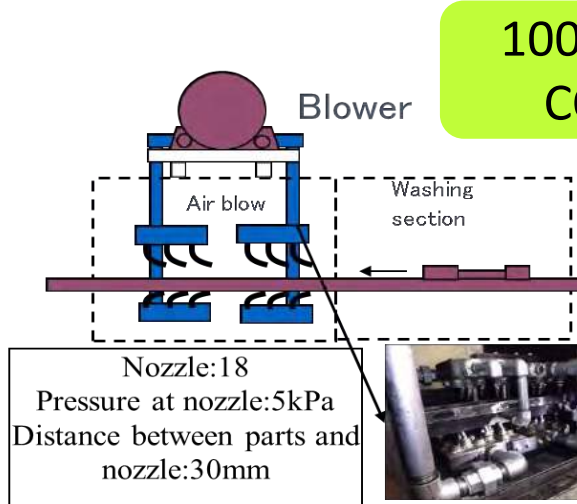


To date 8 ESCO activities (2016-2019) have been completed in which:

- 1 155 low/no cost, low payback kaizens discovered & implemented by end of 2019
- 2 186 kaizens w/ longer payback (> 2 yrs.) being reviewed to implement

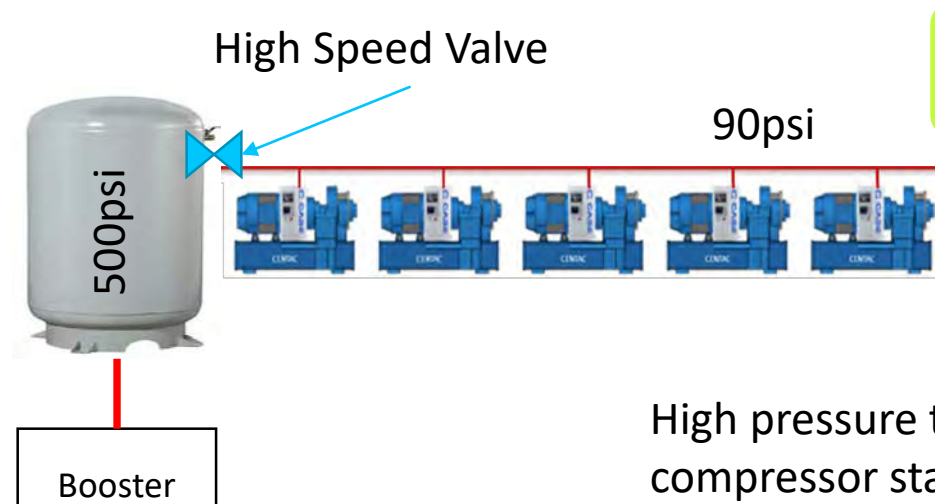
What are some examples of kaizens discovered?

100 MT/washer CO₂ Savings



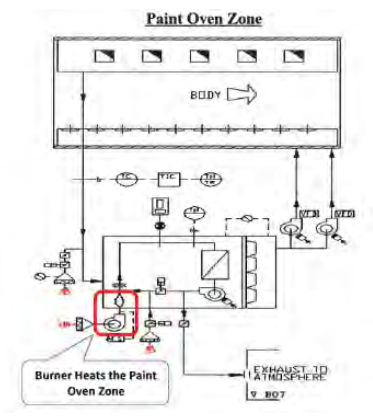
Blower
Air blow
Washing section
Compressed air to electric blowers in washers
Nozzle: 18
Pressure at nozzle: 5kPa
Distance between parts and nozzle: 30mm

2,600 MT CO₂ Savings



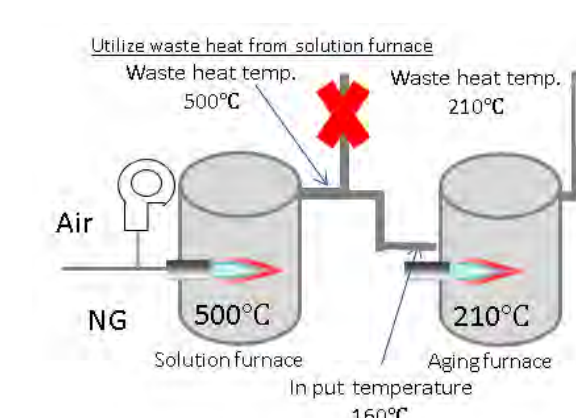
High Speed Valve
90psi
500psi
Booster
High pressure tank to reduce compressor start ups

300 MT CO₂ Savings



Paint Oven Zone
BODY
Burner Heats the Paint Oven Zone
EXHAUST TO ATMOSPHERE
New oven burners allow set back during non-production times

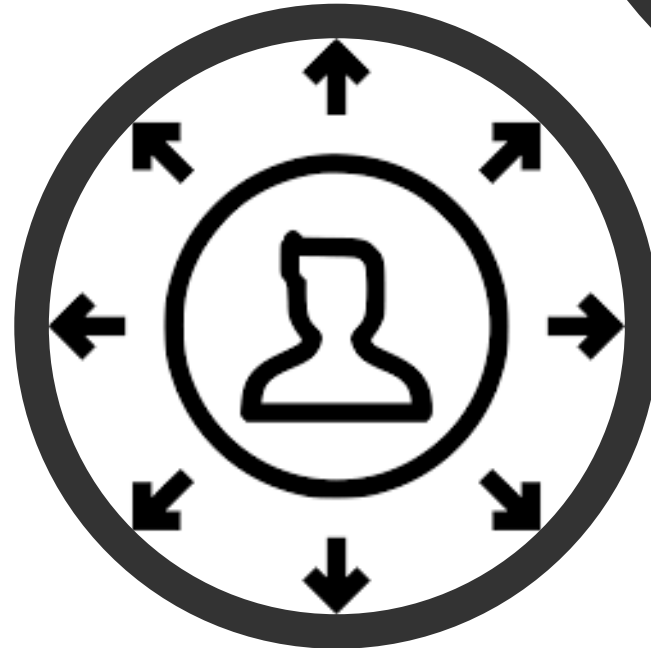
360 MT CO₂ Savings



Utilize waste heat from solution furnace
Waste heat temp. 500°C
Waste heat temp. 210°C
Air
NG
500°C
Solution furnace
210°C
Aging furnace
In put temperature 160°C
Utilize waste heat from heat treatment

What are the challenges?

- Time
- Payback length
- Project Funding
- Manpower



Summary

- New opportunities added to master list
- Kaizens kept in database for sharing
- Educate Team Members
- ESCO ongoing process
- Toyota effectively growing energy team with every ESCO





THANK YOU