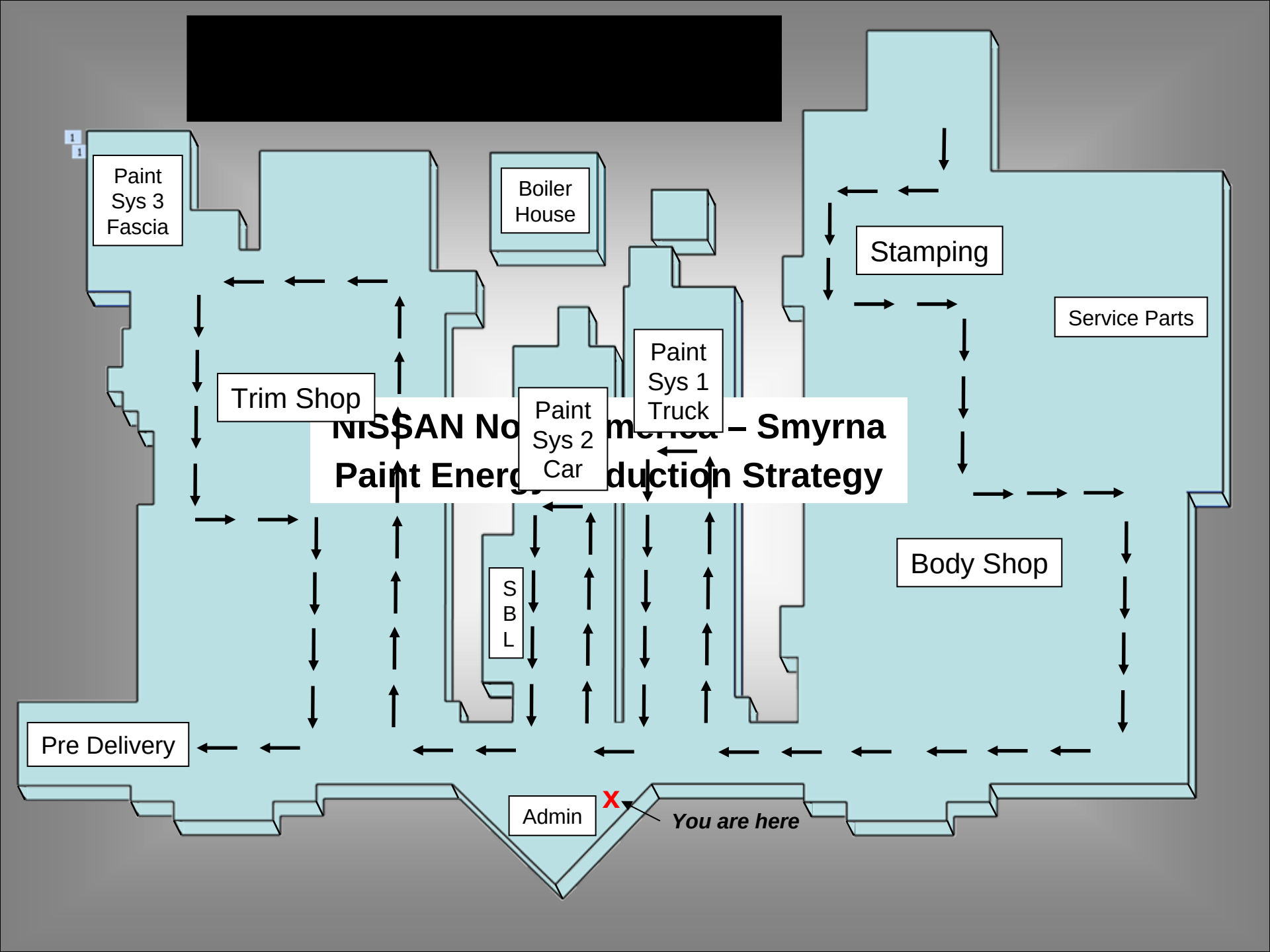
Smyrna Paint Plant

Energy Reduction Strategy

by Wade Royal


Paint Sys 3 Fascia
Boiler House
Stamping
Service Parts
Paint Sys 1 Truck
Trim Shop
Paint Sys 2 Car
Body Shop
S B L
Pre Delivery
Admin
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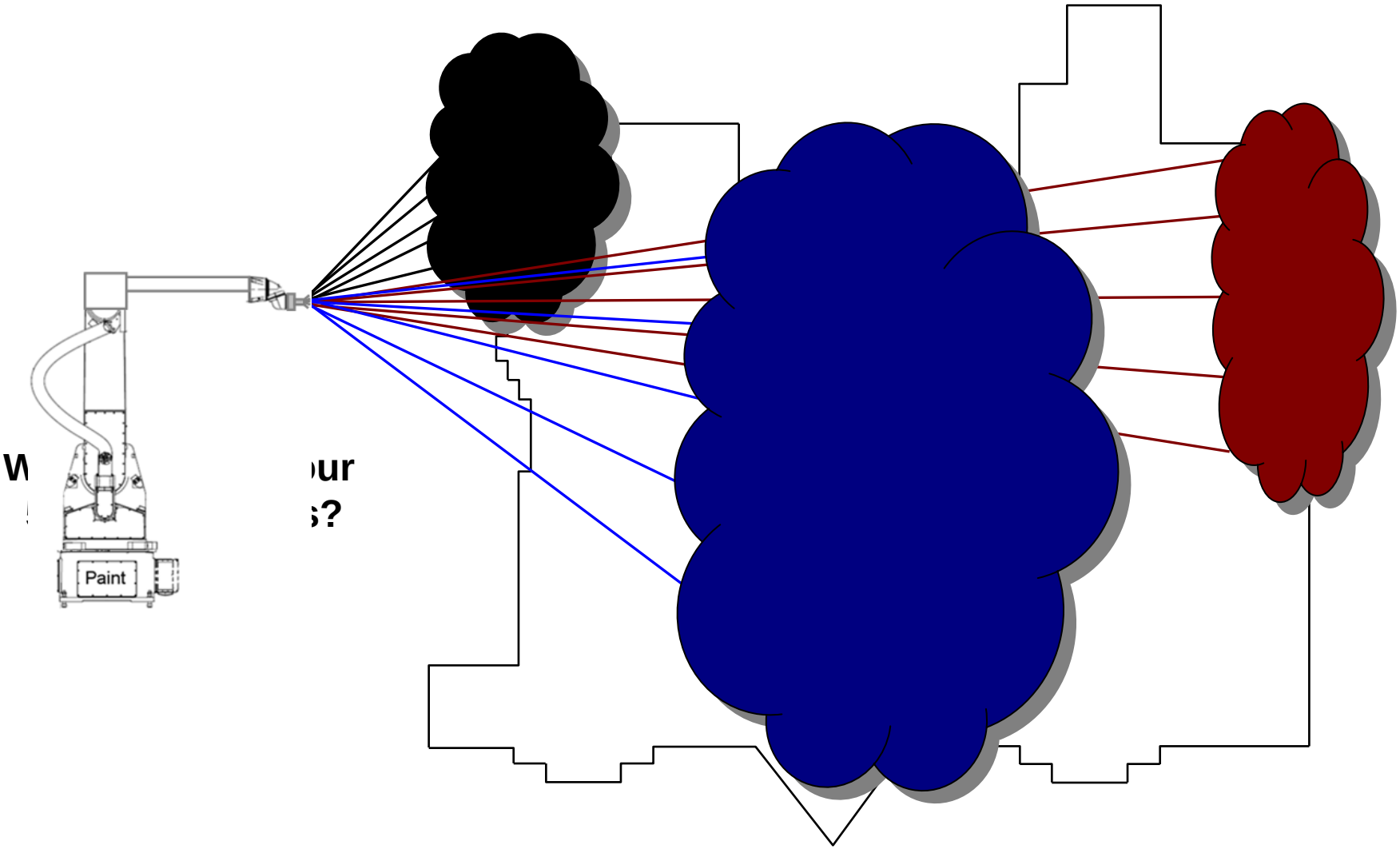
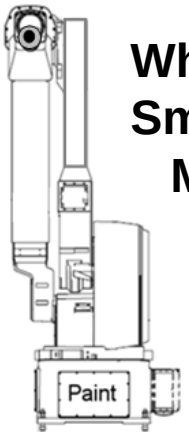
You are here

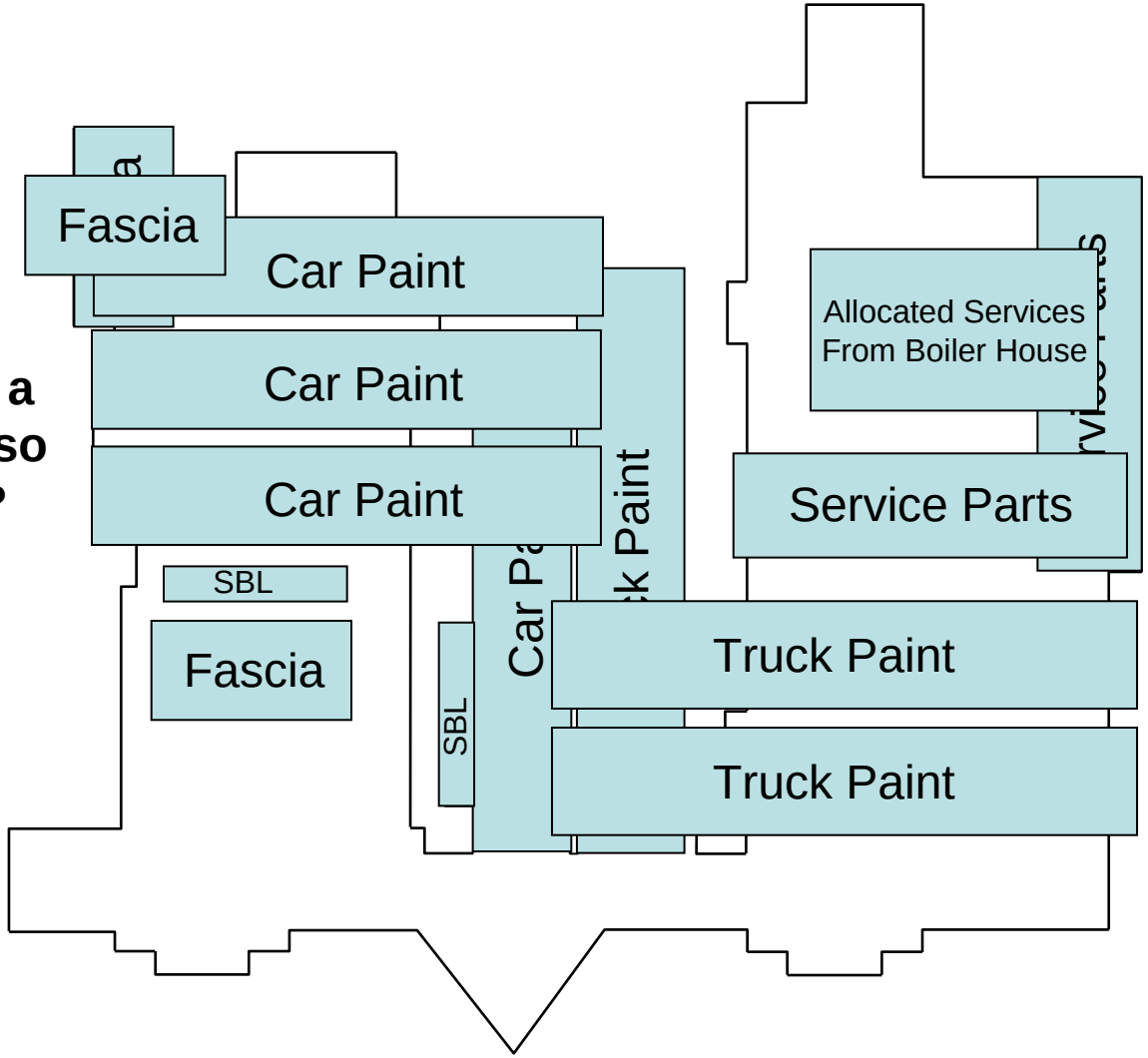
Our 5 Paint Systems Use *70%* of the Energy at NNA-S



Our 5 Paint Systems Use *70%* of the Energy at NNA-S



Why does such a Small area use so Much energy?

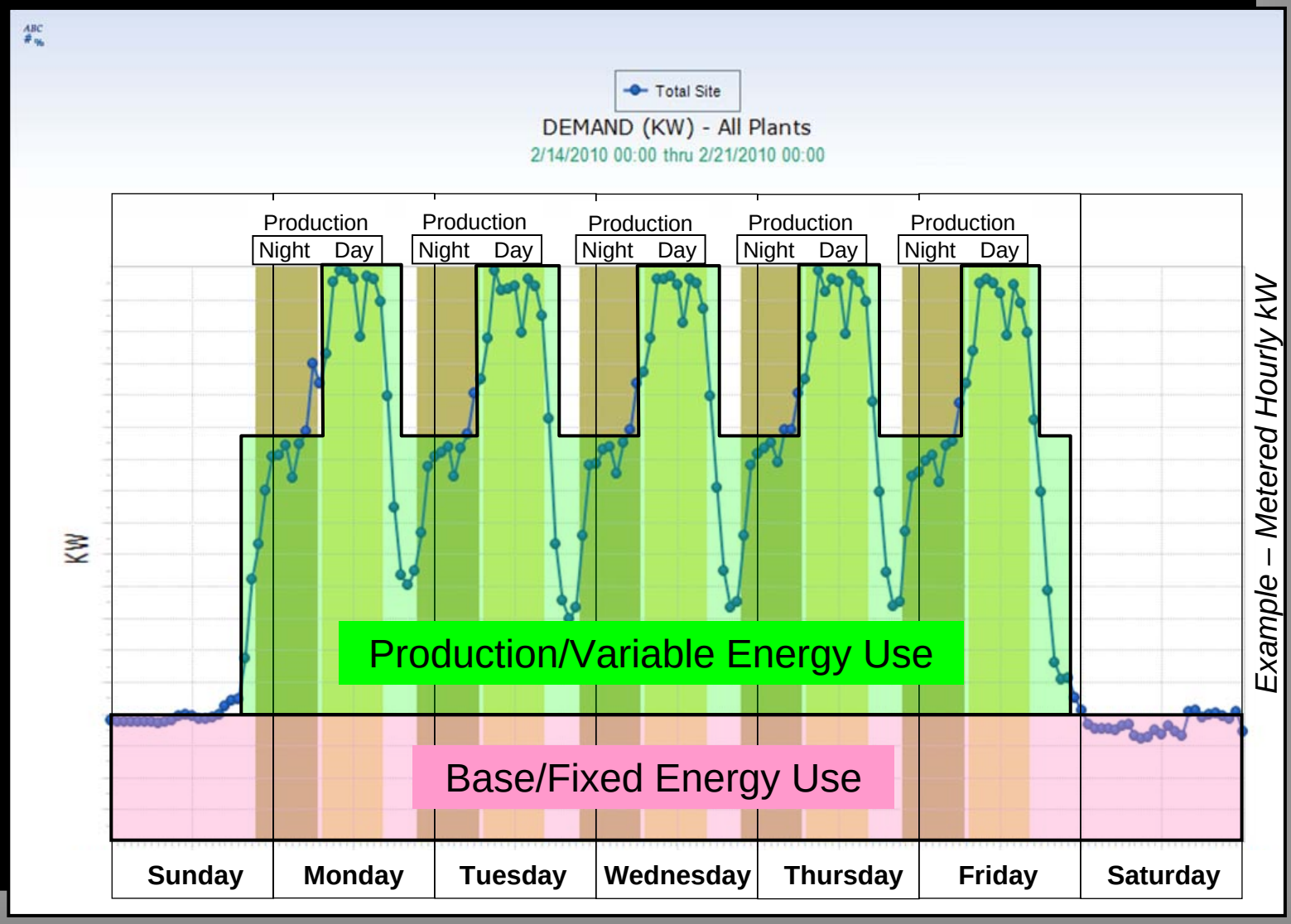


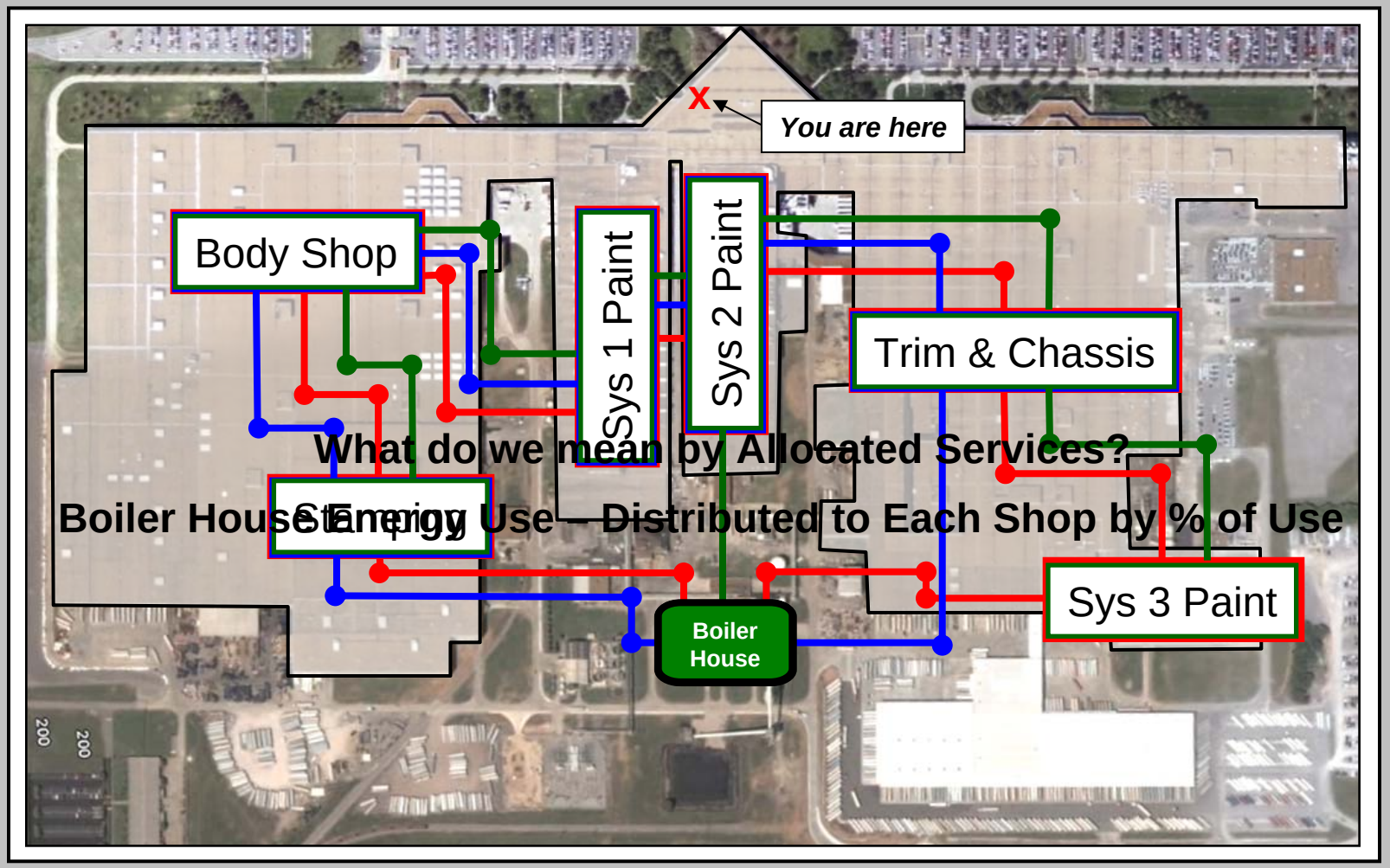
Multiple Floors with Air Supply Houses that are controlled to a specific Enthalpy causing Paint to use the most Allocated Services

Challenges Include Understanding our Energy Profile

Understanding "Base or Fixed" & "Production or Variable" Energy Usage

Knowing how "Allocated Services" Contribute to Each Shops Energy Usage

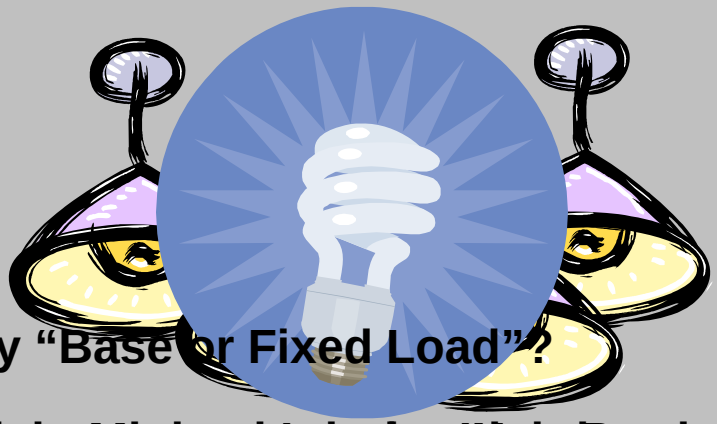




High Temperature Water

Chilled Water

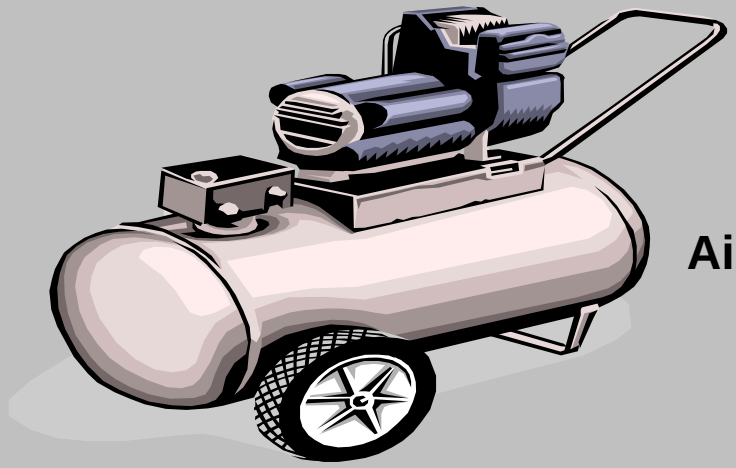
Compressed Air



So what do we mean by “Base or Fixed Load”?

Energy needed to maintain essential processes during production

Minimal Interior Lighting

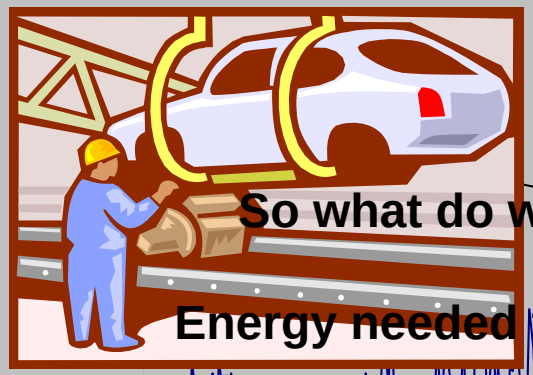


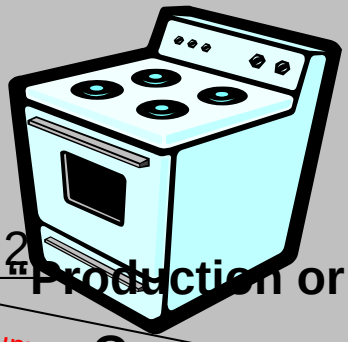
Air Compressors

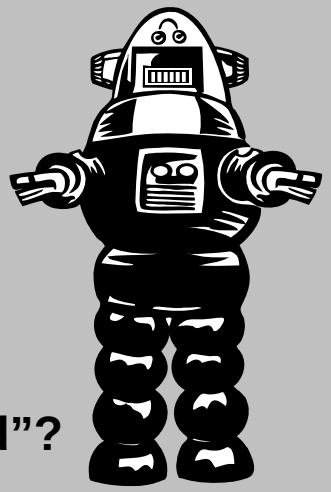
Circulation Pumps

Base Load Reduction ***47%***

Production or Variable Load Reduction *14%*







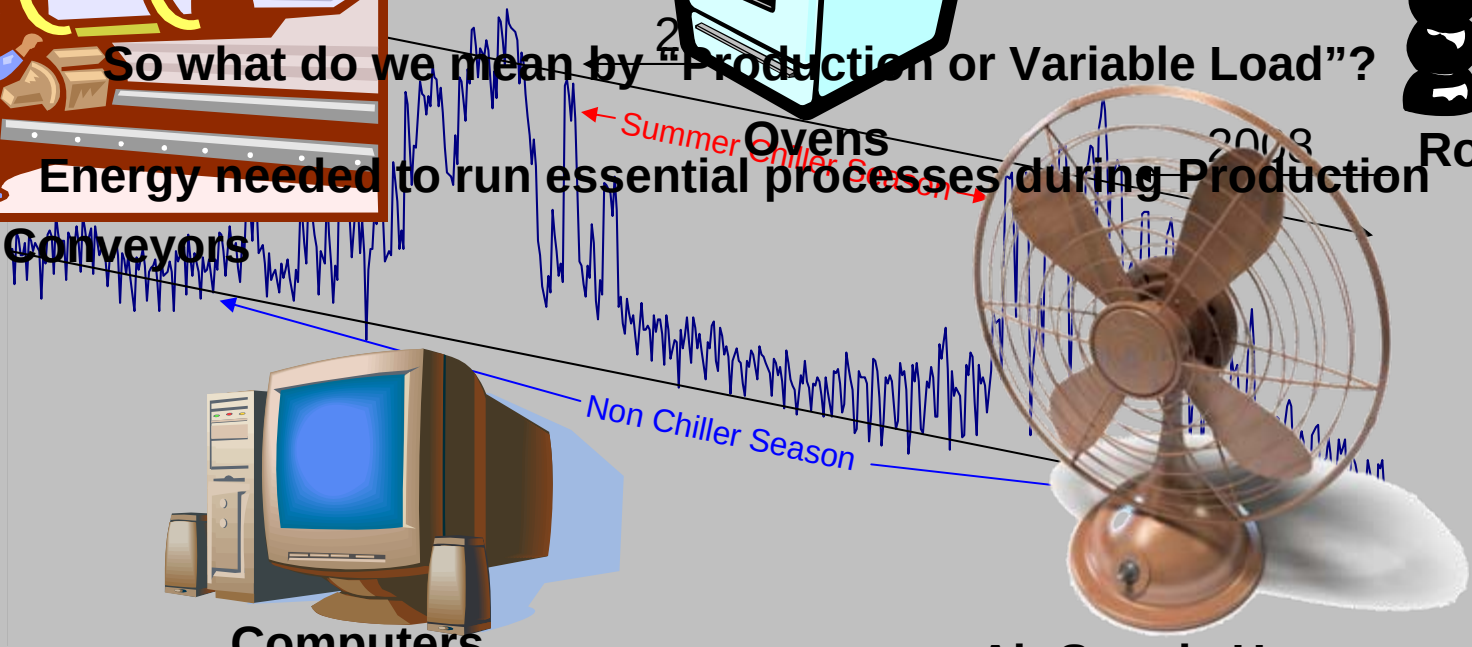
So what do we mean by "Production or Variable Load"?

Energy needed to run essential processes during Production

Conveyors

Ovens

Robots

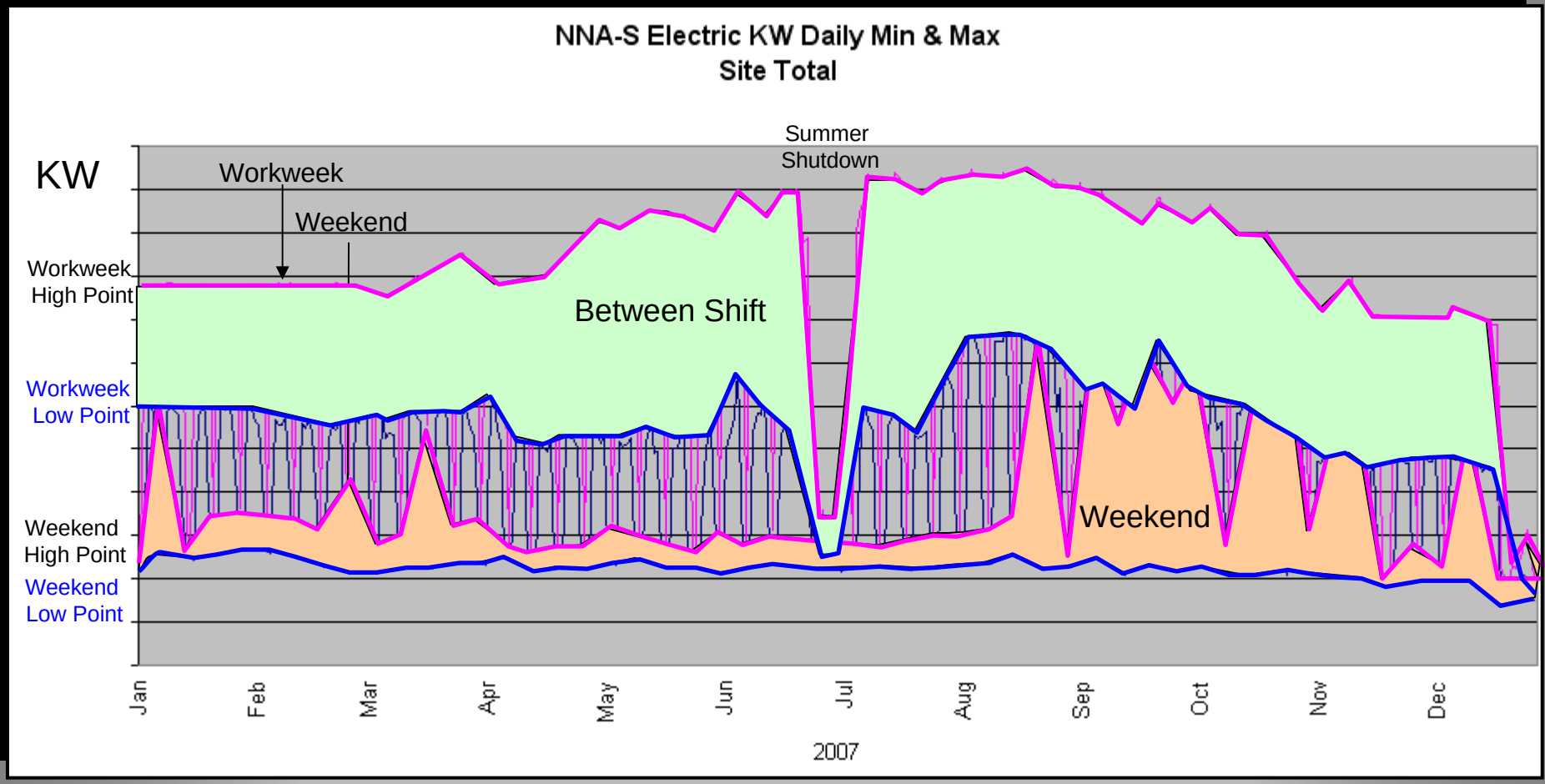


Computers

Air Supply Houses

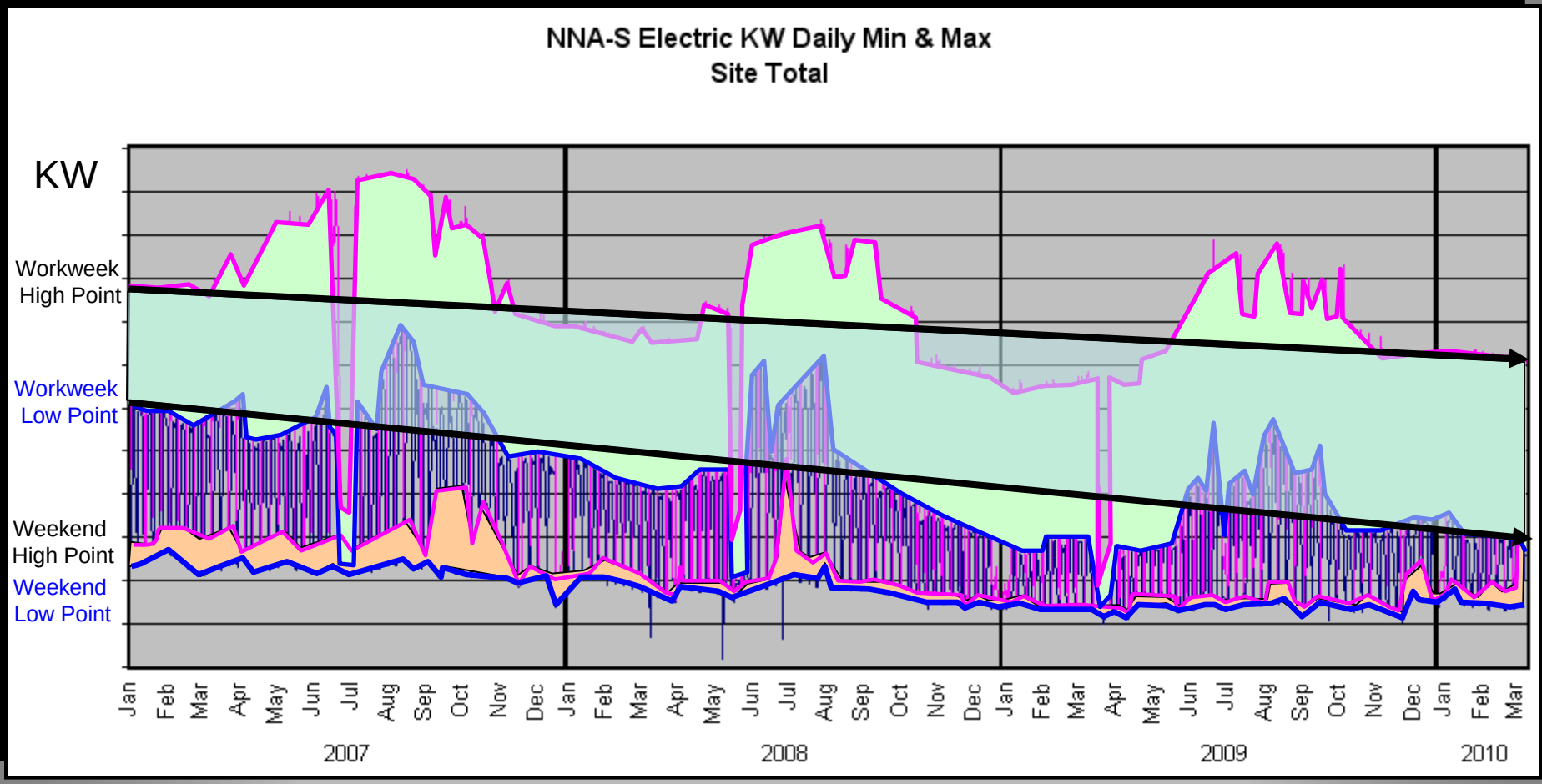
Overall Electric Use Reduction *30%*

Measuring Sustainable Changes



Weekday between shift “Turn-Down Efficiency”
Weekend “Maintenance” and “Clean-Up” energy use

Measuring Sustainable Changes



Increasing Weekday “Between Shift Turn-Down Efficiency” while lowering overall use

Decreasing Weekend “Maintenance” and “Clean-Up” energy use to minimum levels

Verification & Validation Through Metering
"A Sample of Measurable Projects at NNA-S Paint"

- Variable Frequency Drives on ASH Supply & Exhaust Fans
- Florescent "High Bay" Lighting in all 3 Paint Systems
- Oven Controls upgrade in System 1
- Variable Frequency Drives on E-Coat Pumps System 1 & 2
- New Controls on the Air Drier for System 2
- Task Lighting addressed with Timer Switches
- Enthalpy Control logic in Air Supply Houses
- Air Cascading into Paint Process Booths
- Elimination of Daily Test Units into Color Booths
- Employee Engagement in Air Supply House Management
- "Air Drier" to Dew Point Sensor from a Timer Control
- Space Temps set to seasonal Set-Points
- Air Leak repair program initiative
- Hourly KW Alarm monitoring

Challenges & Actions

Focus on ways to operate efficiently, to squeeze the most out of every operating hour

Shut-Down Booths at Lunch, Enthalpy Controls on Air Houses, “Test Unit” evaluation, Employee engagement

Understand the common energy use between Systems and work to Maximize Opportunities

Comparing operating time vs. output and knowing if it’s better to hop on one leg for a long distance or to run on two legs over a shorter distance.

Metering has Allowed Our Decisions to be Data Driven

Being able to Model adjustments to the Manufacturing Schedule to support decision making on how to achieve desired output with the least amount of input

We developed a “Planning Tool” that gives us the flexibility to model Energy Use vs. Operating Patterns

Expose opportunities, large and small, and “Strike while the Iron is Hot”

Once identified, Implement Projects