Condensing Boiler Heat Recovery Project
Resource Conservation Team

**Michael Apodaca**
- Engineering Manager Gatorade
- 26 years with PepsiCo

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- Project Engineer Gatorade
- 11 years with PepsiCo

**Robert Centner**
- Engineering & Maintenance Sr. Resource Gatorade
- 13 years with PepsiCo
AGENDA

1. Company Overview
2. Project Background & Objectives
3. Project Execution
4. Outcome & Sustained Impact
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Ambitious Sustainability Agenda

Internal to Operations

**GOAL NO. 1**
Cut water use by 25% by 2025

60% of NAB’s beverage volume

**GOAL NO. 2**
Reduce absolute GHG emissions by 20% by 2030

330,000 metric tons

**GOAL NO. 3**
Eliminate waste to landfill by 2025

5,700 metric tons
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Typical Heat Recovery Systems

- **City Water**
  - Storage Tank
  - Steam Water Heater
  - Water Purification
  - Purified Water Storage Tank
  - Steam Pasteurization

- **Solar Thermal System**
  - ~70°F

- **Existing Heat Recovery**
  - During Day
  - ~90°F
  - Existing Heat Recovery

- **Remaining Process**
  - >180°F

- **Steam Pasteurization**
  - ~110°F
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Product Heat Recovery System P&ID

Tie into 4 boiler stacks

Flu Ace Condensing Economizer

Condensate Generation to Cooling Towers

Boiler Make Up Water Heat Exchanger

Potential for New Line

Add Solar Thermal to Heat Recovery System
Add Solar to Heat Recovery System

• Existing
  – Solar was not always absorbed
    • Production lines go down throughout the day because of flavor or product changes, cleaning/sanitation, or maintenance
    • In the event of power outages all production lines could go down
    • Solar temperature could exceed temperature limits
  • Benefits
    – Additional heat sink to increase annual energy savings
    – Protect the solar system from overheating
      • In event of no production the condensing economizer is converted to an evaporative cooler
Product Economics

• Installation Costs
  – $1.4MM

• Annual Savings
  – $250M – Fuel
  – $15M – Water
  – $200M Utility incentive
  – 10% reduction in sites fuel usage
Reapplication

Additional Installation Details / Modification's

• Second Site Completed in Florida
  – Trap resizing and push condensate to boiler room condensate receiver
    • All flash at condensate receiver in boiler room
  – Tied boiler exhaust, DA vent, and atmospheric condensate receiver to the condensing economizer
  – Plant has a shrink label system which uses direct steam at thermal source.
    • This venting steam was added to condensing economizer loop and doubled thermal recovery
• Third site under construction in Texas
Condensate Generation

- Condensing economizer generates a significant amount of condensate
- Simplest home is down the drain
- Second simplest is cooling tower and where previously used (120F-140F)
- When in combustion recovery alone pH is low, when steam tunnel recovery is added pH in close to neutral
- Second installation worked with boiler chemistry provider
  - Studied opportunity and potential challenges
  - Added ability to send water to boiler and cooling tower
  - Working well in boiler
  - Condensate is higher quality than city water so helped reduce water chemistry and boiler blow down losses
Conclusion

QUESTIONS?