Reducing Energy Intensity:

“If Sweat the Small Stuff”

Valerie Gipson – Engineering & Sustainability Coordinator
History of Florida’s Natural Growers

- **1933** - *Florida's Natural Growers* was organized in 1933. A grower cooperative based in Lake Wales, FL.

- **1940’s** - To provide juice for the military during World War II, we build a concentrate plant in Lake Wales, Florida.

- **1960’s** - People want chilled juice products. We're happy to oblige, adding a variety of new juices and warehouses to store refrigerated cartons of juice.

- **1987** - We commit to crafting only the finest, premium, never-from-concentrate juices. The Florida's Natural® brand is born.

- **2015** - Today, we are one of the largest cooperatives of citrus growers. We’re 1,000 grower-owners strong. Working 60,000+ acres of fine citrus groves here in the heart of Central Florida.
Challenges of the Industry

- Economic recession 2001-2003
- The hurricanes in 2004 damaged facility and devastated crops
- Hurricanes in 2005 caused natural gas prices to spike greater than $10/MMBtu and spread disease:
  - Citrus Greening (huanglongbing or HLB)
  - Citrus Canker
Source: U.S. Department of Commerce(2)
Henry Hub Natural Gas Spot Price

Dollars per Million Btu

Source: U.S. Energy Information Administration (3)
Challenges of the Industry

- Recession during the late 2000’s contributed to a significant reduction in juice sales

**Personal Consumption Expenditures**

Source: U.S. Dept. of Commerce - Bureau of Economic Analysis

- But Florida’s Natural survives and THRIVES!
Goals

- Reduce energy consumption
  - Joined the Better Plants Program
  - Pledged to reduce energy consumption by 25% in 10 years

- Reduce greenhouse gas emissions

- Improve overall environmental sustainability by reducing:
  - Solid Waste
  - Water Usage
  - Chemical Usage
Obstacles

Establish baseline

- Challenging with crop reductions and declining OJ sales nationally
- Economies of scale, maintaining and reducing CPU’s

Develop methods to measure energy consumption per unit

- A single measure at our facilities is inaccurate reflection:
  - Warehousing (frozen and chilled)
  - Multiple types of packaging lines
  - Fruit processing (seasonal)

- Metering not isolated
- Allocation models outdated
How do you eat an elephant?

One “SMALL” Bite at a Time
How do you eat an elephant?

- **Years 1 – 3**
  - Measure
  - Evaluate
  - Plan

- **Year 4**
  - Involve Staff
  - Communication

- **Year 5**
  - Standards
  - Accountability
  - All Sustainability Elements
Years 1-3

- Worked with Dept. of Energy - Better Plants to develop measures of energy intensity that were meaningful to our operation
- Reevaluated metering and related allocation models
- Compared GHG emissions reporting changes to the Better Plants annual reporting to identify areas of inaccuracy
- Completed small insulation projects
Year 4

- Established departmental weekly shutdown check lists to reduce leaks and losses

- Customized and detailed shutdown check lists help improve accuracy and completeness (reduce pencil whipping)

- Focused on reporting production schedules to utilities departments to reduce energy production (steam/electricity) in a more timely manner
Time to Change the Game
Year 5

Developed Sustainability Scorecard

*Energy Management*
- Leaks reported/repaird
- Participation in energy audits/team meetings with energy topics
- Updating weekly steam needs chart
- Calling in to Boiler Room when clean-ups are complete
- Completing shutdown checklists weekly
- Random energy audit performance

*Environmental Management*
- Monthly stormwater inspections
- Random stormwater and tank integrity audits

*Waste Management*
- Water Use
- COD lbs. in waste water
- Solid Waste Tonnage
- Hazardous Waste lbs.
Energy Intensity Changes

Production to MMBtu

- Total MMBtu
- Fruit Boxes
- 3 Gal Production
- Evaporation
- Linear (Total MMBtu)

Largest Energy Consumption/Prod Unit

- 2010 2011 2012 2013 2014 2015
Year 5

Chemical Reuse Systems

Team/Project Studies & Capital Investment

- Identified areas/systems that could have CIP systems piped together
- Tested caustic solution against efficacy to lower concentration while maintaining sanitation

Results

- Reduced concentration = reduced caustic use
- Reduced water and steam usage
- Reduced direct chemical use due to refortification
Sweat the Small Stuff...

- Steam valve/line insulation
- Leak identification and repair
- Reuse
  - Water/Condensate return
  - Chemicals
- Behaviors
- Accountability

Don’t... Sweat the Small Stuff
Obscurity
Time to look under the bed.....

Overall Sustainability

- Energy Savings in hidden places
- Water consumption - pumps
- Chemical use, boilers and clean up systems

- Evaluate extraneous processes such as solid waste
  - Reduce solid waste
  - Increase recycling
Be the Green Police

Recording
- Identify and report leaks
- Track repairs
- Track process improvements

Reporting
- The importance of accuracy – (not as important as you think)
- Timely – as often as reasonable (not less than monthly)

Accountability
- Senior management support
Sometimes you have to make a stink...

To come out smelling like a Rose!
Resources

1 – National Hurricane Center – National Weather Service
   2005 North Atlantic Hurricane Tracking Chart
   https://upload.wikimedia.org/wikipedia/commons/7/78/2005_Atlantic_hurricane_season_map.png

2 – U.S. Department of Commerce – National Weather Service
   2008 North Atlantic Hurricane Tracking Chart
   https://upload.wikimedia.org/wikipedia/commons/d/dd/2008_Atlantic_hurricane_season_map.png

   http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm

4 - U.S. Department of Commerce – Bureau of Economic Analysis. Personal Consumption Expenditures.
   http://www.bea.gov/iTable/iTable.cfm?reqid=9&step=1&acrdn=2#reqid=9&step=3&isuri=1&903=65

5 - U.S. Orange Juice Sales Post Biggest Decline in Nearly 3 Years. The Ledger. 4March2015.
   http://www.theledger.com/article/20150304/NEWS/150309713/0/search
Thank you!

QUESTIONS?

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