

Water and Energy Efficiency Analysis at Lloyd's Barbeque

Ayotunde Olatunbosun

MnTAP Advisor: Matthew Domski

On-Site Supervisor: Chuck Morrissette



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Company Overview

- **Founded by Lloyd Sigel on September 20th 1978**
- **Initially produced precooked barbequed ribs**
 - Introduced line of shredded pork, chicken, and beef with increased popularity
- **With increased awareness on the effects of its expansion, it is motivated to reduce cost by 2020**



Motivations For Change

2020 Goals

Energy:
Non-Renewable
Energy Use

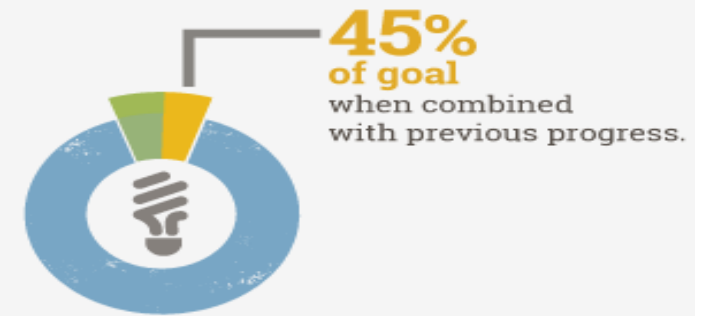


Water Use

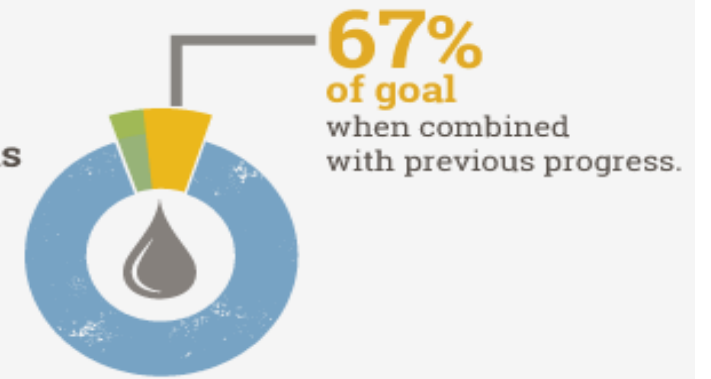


2014 Progress

Reduced
17,400
MMBtu



Reduced
0.082
billion gallons
of water



<http://2014csr.hormelfoods.com/about-this-report/2020-goals/>

Reasons for MnTAP Assistance

- **Audit utility usage -- verify largest sources of consumption**
- **Evaluate strategies to reduce:**
 - Water consumption
 - Amount of wasted product
 - Energy consumption
- **Determine savings associated with final recommendations**



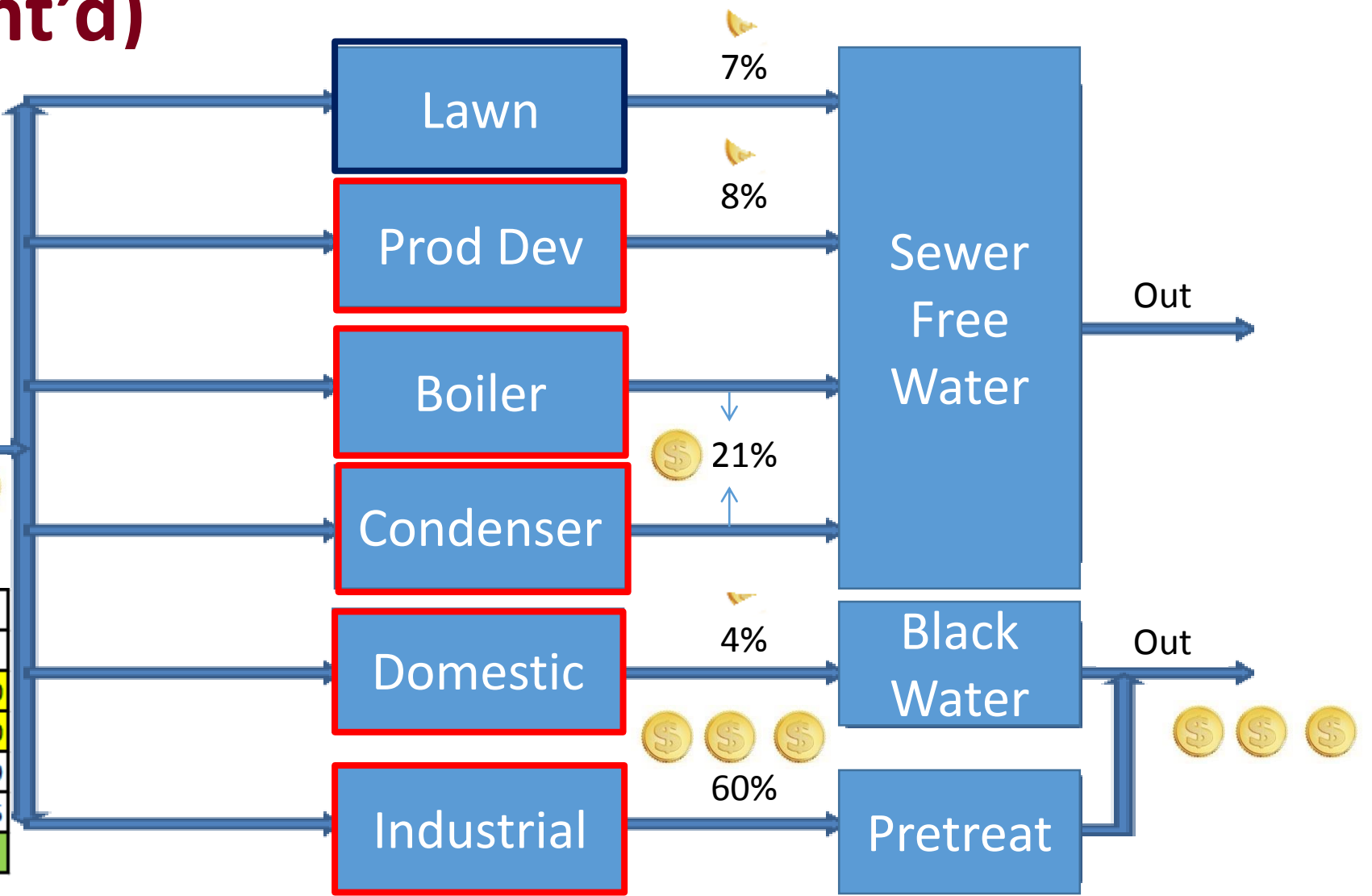
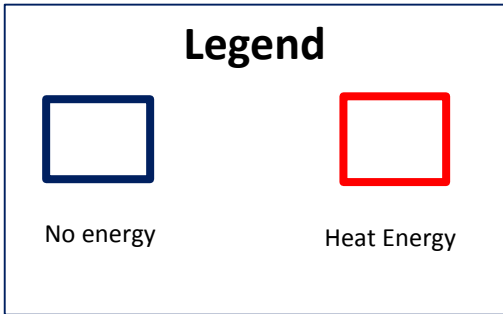
<http://mtdeafblind.ruralinstitute.umn.edu/Images/technical%20assistnace.jpg>

Approach

- Investigate water/energy consumption throughout the plant
 - Industrial Waste Discharge Report (water supply/ consumption)
- Understand Impact of solid waste
 - Industrial Waste Discharge Report (TSS/COD)



Approach (Cont'd)



Strength Charge Determination	
V(gal)	6,000,000.00
TSS(mg/L)	300
COD(mg/L)	9000
TSS Rate(\$/lb)	0.19
COD Rate(\$/lb)	0.095
Strength Charge	\$ 40,909.21

Investigating Opportunities

- **Prioritized focus based on importance and time availability.**

Lawn



- Took daily meter readings to confirm trend/analyze consumption
- Talked to current employees
- Read system manual to determine how the control was set up

Industrial Boiler



- Toured the plant on my own multiple times to take down observations
- Talked to current employees
- Analyzed water usage/shift to determine heaviest user of water

Recommendations

Lawn

Recommendations	Waste/Water/Energy Reductions Per Year	Implementation Cost	Net Savings Per Year	Payback Period	Status
Optimize Lawn Irrigation	128,800 gallons	\$3,300	\$3,000	1.1 years	Implemented

- Why – Rain meter control inactive, watering time and schedule, system leaks
- Solution – Fix leaks, install new rain meter, install master control valve, and optimize watering schedule



Recommendations

Industrial

Boiler

Recommendations	Waste/Water/Energy Reductions Per Year	Implementation Cost	Net Savings Per Year	Payback Period	Status
Wash Tank Temp. Regulation	33,100 therms	\$2,500	\$30,500	1 month	Implemented

therms/year of natural gas to preheat and maintain water temperature at 210 degrees Fahrenheit

- Why – Direct steam injection, no insulation or lid cover
- Solution – Reduce temperature to 140 degrees average as recommended for washing, add insulation to sides of tank



Recommendations

Industrial

Boiler

Recommendations	Waste/Water/Energy Reductions Per Year	Implementation Cost	Net Savings Per Year	Payback Period	Status
Optimize hot water pump	17,400 therms 1,324,800 gallons 42,950 Kwh	N/A	\$20,000	Immediate	Implemented

- High pressure, at 250 PSI
- Solution – Reduce pressure because pump motor is a variable speed drive



Recommendations

Industrial

Recommendations	Waste/Water/Energy Reductions Per Year	Implementation Cost	Net Savings Per Year	Payback Period	Status
Employee Training on Solid Waste	80,000 lb.	N/A	>\$275,000	Needs Further Analysis	Recommended

(especially third shift)

- Solution – Increase shredded product retention, begin dry cleaning during down time



Benefits Table

Recommendations	Waste/Water/Energy Reductions Per Year	Implementation Cost	Net Savings Per Year	Payback Period	Status
Optimize lawn irrigation	128,800 gallons	\$3,300	\$3,000	1.1 years	Implemented
Wash tank temperature regulation	33,100 therms	\$2,500	\$30,500	1 month	Implemented
Optimize hot water pump	17,400 therms 1,324,800 gallons 42,950 Kwh	N/A	\$20,000	Immediate	Implemented
Employee training on solid waste	80,000 lb.	N/A	>\$275,000	Needs Further Analysis	Recommended

Personal Benefits

- **Importance of communication**
- **Data/Cost benefit analysis**
- **Exposure to Industrial equipment**
- **Environmental Compliance**
- **Importance of team work and the role of individual confidence**
- **Information not as organized as it is in college level classes**

Questions



http://www.csplates.co.za/wp-content/uploads/2015/01/bg_faq.jpg