Compressed Air Energy and Water Reduction

Phillips Distilling Company

Nathaniel Scherer
Project Advisor: Michelle Gage
Company Supervisor: Larry Jurik

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Phillips Distilling Company (Princeton, MN)

- **Produce several top brands of alcoholic beverages**
  - UV
  - Phillips
  - Prairie
  - Many more!
- **Also import wine and spirits**
- **Ship ~7 million cases/year**

https://www.thespiritsbusiness.com/2015/01/diageo-exec-joins-uv-vodka-producer-as-ceo/
http://chilledmagazine.com/industry_news-detail/phillips-distilling-company-announces-international-expansion-for-uv-vodka

Incentive for Change

"One Team: G.R.E.E.N."

- Sustainability committee
- Environmental responsibility is economical

- **Biggest reduction opportunities:**
  - Compressed air
  - Water use/discharge

https://www.rit.edu/kgcoe/ise/sites/rit.edu.kgcoe.ise/files/images/Sustainable%20graphic.jpg

MnTAP Assistance

Compressed air opportunity

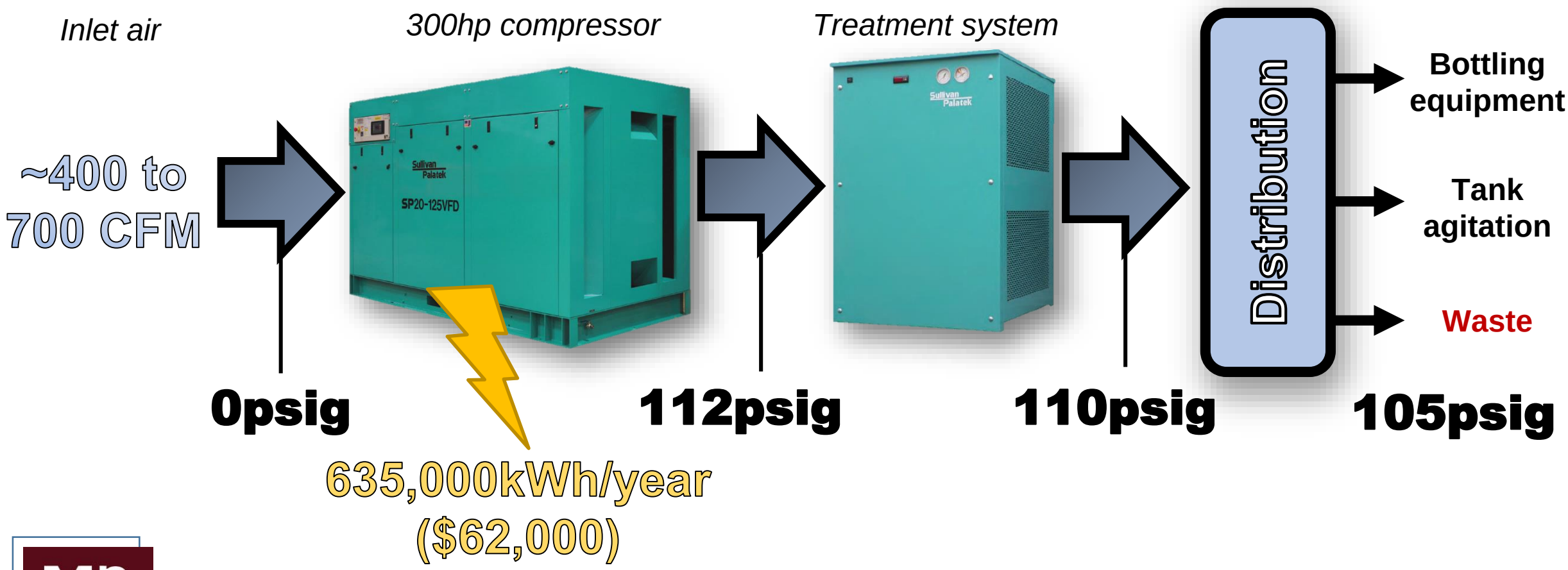
- Compressed air audit (rebate from Connexus)
- Compressed air maintenance plan
  - Detect, tag, record, and fix all leaks
- Identify compressed air costs
- Improve compressed air system efficiency

CONNEXUS® ENERGY

Approach (compressed air)

- Study the system
- Breakdown energy usage
- Identify opportunities
- Develop recommendations

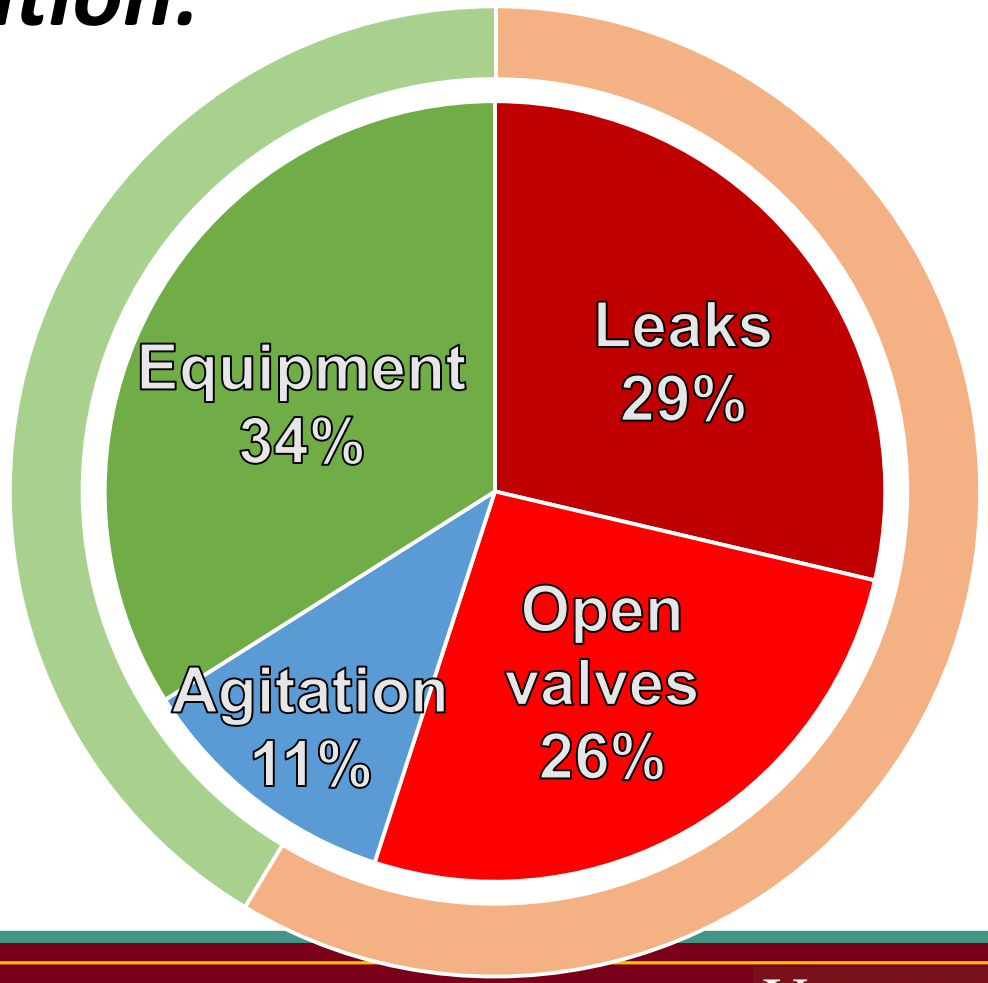
Process overview (compressed air)



Compressed air usage

Demand distribution:

Proper use
41%



Reduction
opportunity
59%

Recommendations (compressed air)

1. Compressed air system maintenance

Annual energy reduction	Implementation cost	Annual savings	Payback period	Status
158,000kWh	$750	$15,500	2 weeks	Implementing

- **Used leak detector to identify 35 leaks**
  - ~125CFM demand (158,000kWh/yr)
  - Fixed 54% of leaks, plans to fix remaining
- **Created compressed air maintenance program**

Recommendations (compressed air)

2. Closing open equipment valves

Annual energy reduction	Implementation cost	Annual savings	Payback period	Status
150,000kWh	<$6,000	$14,600	<5 months	Implementing

- Develop procedures for closing air valves
- Install solenoid valves where necessary

Recommendations (compressed air)

3. Pressure/flow controller

Annual energy reduction	Implementation cost	Annual savings	Payback period	Status
38,000kWh	$4,000	$3,700	1.1 years	Recommended

- **Control pressure in plant**
- **Reduce compressor pressure from 112psig to 100psig**

Recommendations (compressed air)

4. Regulating air use for tank agitation

Annual energy reduction	Implementation cost	Annual savings	Payback period	Status
31,000kWh	none	$3,000	-	Recommended

- Raise awareness
- Standardize procedures
- Regulate and time air use

Compressed air recommendations

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Leak prevention program	158,000kWh	$750	$15,500	2 weeks	Implementing
Closing equipment valves	150,000kWh	<$6,000	$14,600	<5 months	Implementing
Pressure/flow controller	38,000kWh	$4,000	$3,700	1.1 years	Recommended
Regulating agitation air	31,000kWh	-none-	$3,000	-none-	Implementing
Electric bag inflators	11,000kWh	$2,300	$1,000	2.3 years	Recommended
Total	**388,000kWh**	**$13,000**	**$38,000**	**4 months**	

MnTAP Assistance

Water

- High water discharge (nature of process)
- Expensive to dispose
- Find ways to **reduce** and **recycle** water

Approach (water)

- Study the system
- Sample wastewater streams
- Develop strategies to reuse wastewater

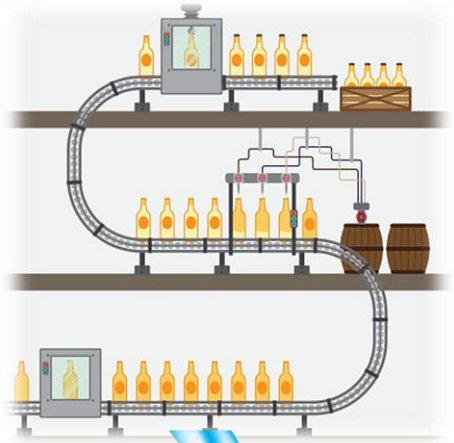
Process overview (water discharge)

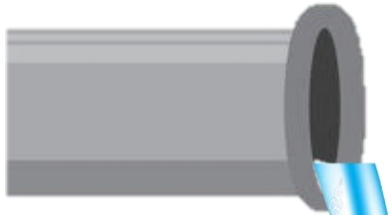
Production floor spills

Tank rinses

Flushing unused product from transfer pipes

Captured high-strength





Above ground production area

Floor grates / gutters

Underground wastewater sump

Pumped out as waste

http://www.istockphoto.com/vector/beer-factory-gm491619782-75838291?esource=SEO_GIS_CDN_Redirect
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http://images.clipartpanda.com/bottle-20clip-20art-wine-bottle.png
http://www.clker.com/cliparts/f/h/W/V/l/p/recycle-bin-hi.png

Recommendations (water)

1. New rotating spray balls

Annual wastewater reduction	Implementation cost	Annual savings	Payback period	Status
~150,000gal	$2,500	$9,000 to $16,000	<4 months	Recommended

- **~50% less water per rinse**
- **Easy to implement**

Recommendations (water)

2. Reusing low-strength wastewater

Annual water reduction	Implementation cost	Annual savings	Status
~160,000gal	Needs further analysis	$10,000 to $18,000	Needs further analysis

- **Final tanks rinses are very clean**
- **Still investigating where this water can be reused**

Water reduction recommendations

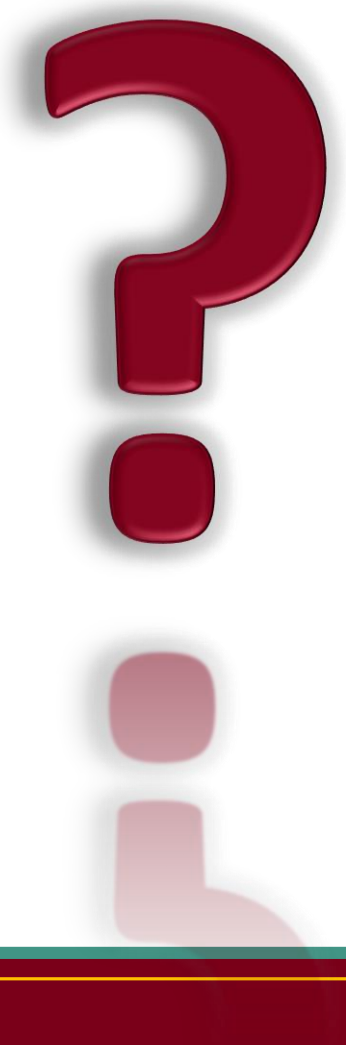
Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Reusing rinse water	280,000gal water	Unknown	>$10,000	Unknown	Investigating
New spray balls	150,000gal water	$2,500	>$9,000	<4 months	Recommended
Total	**430,000gal water**	**Unknown**	**>$19,000**	**Unknown**	**Investigating**

Company benefits

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Compressed air total	388,000kWh	$13,000	$38,000	4 months	Implementing
Water total	430,000gal water	Unknown	>$19,000	Unknown	Investigating
Insulating boiler pipes	10,000therms	$2,200	$6,000	4 months	Implementing

My experience

- Industry-tailored sustainability solutions
- Production manufacturing practices
- Communication
- Accountability



Thank you!