



Green Your Bottom Line

Improve Sustainability and Reduce Operating Costs in Your Food or Beverage Business

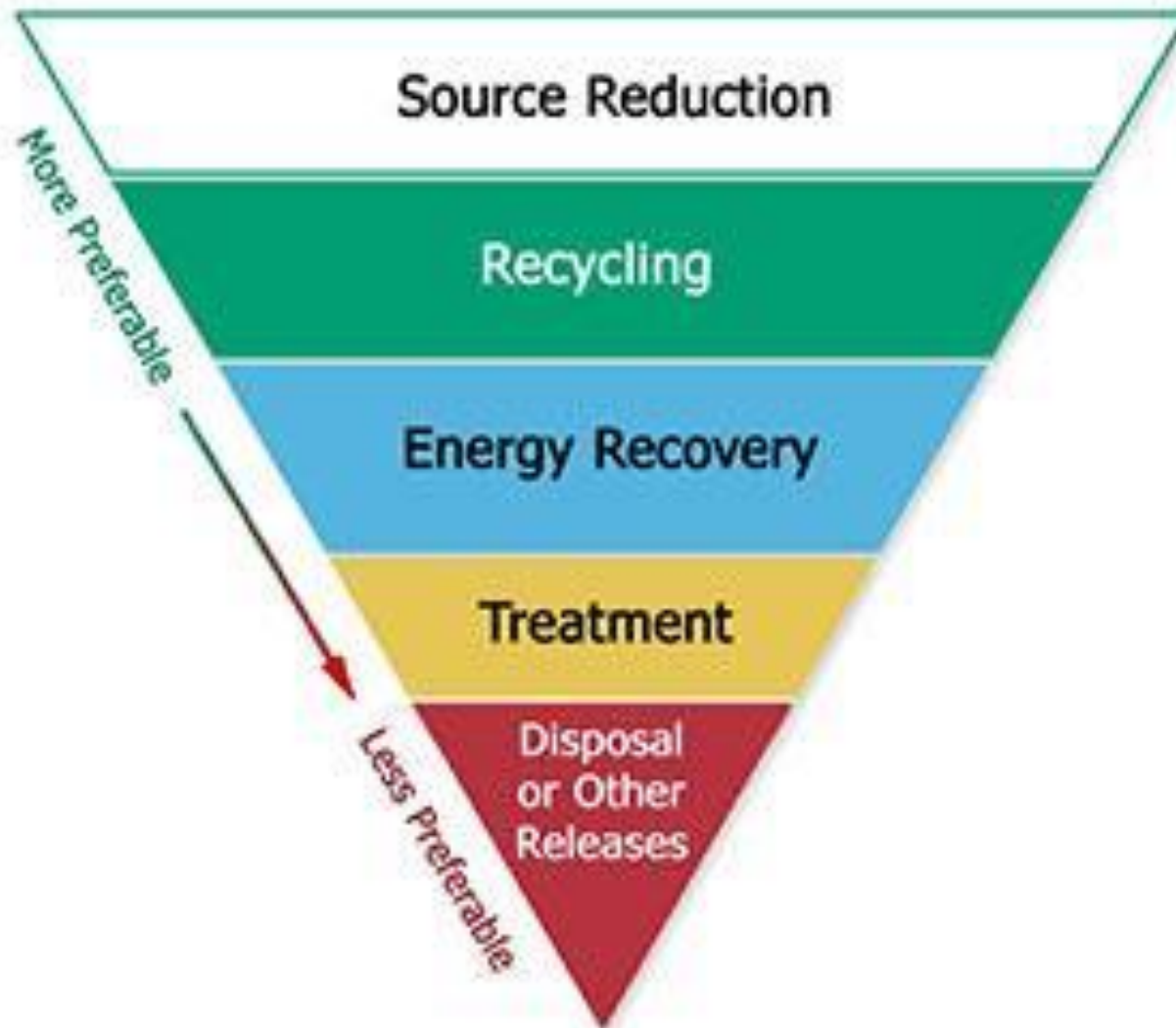
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January 2018

Outline: Opportunities in Food Manufacturing/Processing

- Pollution Prevention Hierarchy
- Energy
- Toxics use reduction
- Water



Pollution Prevention Hierarchy



Benefits of Energy Efficiency

- Reduce operating costs
- Reduce emissions
- Improve compliance
- Reduce maintenance costs
- Improve work environment
 - Light quality
 - Temperature control, comfort
- Customer expectations
- Earn utility incentives/rebates or other grants

Identifying Efficiency Opportunities

- External assessment
 - Utilities often provide free energy audits
- Internal suggestions or “treasure hunt”
- Equipment vendors
- [ENERGY STAR Focus on Energy Efficiency in Food Processing](#)

Energy Efficiency Opportunities

- Refrigeration and process cooling
 - Install automated controls
 - Optimize sequencing of equipment
 - Upgrade motors, use variable frequency drives
 - Install automated doors, strip curtains, night covers
- Ovens and process heating
 - Insulation
 - Clean and tune boilers
 - Recover heat from oven or boiler exhaust
 - Maintain steam traps

Energy Efficiency Opportunities

- Compressed air systems
 - Adjust pressure setting
 - Repair leaks
 - Eliminate unnecessary uses of compressed air
 - Increase storage

Moving Forward

- Energy efficiency is a cost-effective way to reduce operating costs
- There are opportunities in every food and beverage business
- Take advantage of free technical assistance and funding

Toxics Use Reduction

- **Core Principles of Toxics Use Reduction**
 - Reduce toxics at the source
 - Look for opportunities to eliminate or reduce hazard
 - Primary prevention of disease

Toxics Use Reduction

- **Opportunities**

- Cleaning and Sanitizing
- Clean in place improvements
- Investigate soils, surfaces, processes, chemicals
 - Look for opportunities to eliminate or reduce hazard
- Pest Management
- Water and wastewater treatment

Toxics Use Reduction

- **Moving Forward**

- Find out what chemicals are used in your business and track them
- Find out what the chemicals are being used for
- Look for ways to reduce toxic chemical use
 - Less toxic alternatives, change in process

Water Efficiency

- Create a water balance (inventory)
 - Identify top users, reduction options
 - Look at total in – total out
- Top water users
 - Clean in place (CIP)
 - Heat exchanges (ex. cooling towers)
 - Manual cleaning
 - Sanitation

Water Efficiency Opportunities

- Good Housekeeping
 - Tracking, Inspection, Leak Detection, Maintenance
 - Turn off lines, sprays and hoses when not in use
- Process water recovery / reuse
- Wastewater treatment, (ex. membrane filtration)

Water Efficiency Opportunities

- Efficient fixtures/equipment
 - Smaller diameter hoses, low flow nozzles
 - WaterSense equipment
 - Sensor automated stop/start controls
 - Spring load auto-shutoff
- Reducing cooling tower bleed-off, filtration
- Process modifications (e.g. caustics peeling, alternative transport mechanism)

Water Efficiency

Cleaning improvements

- High pressure low volume sprays
- Low pressure foam cleaning
- Pre-soaking of floors and equipment
- Optimization of clean in place processes
- Pigging
- Pulse rinse
- Single phase cleaning (organics and minerals)
- Air blows, compressed air, vacuum systems
- Dry ice, other technologies



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