Food Safety and Sustainability

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AGENDA

By the end of this session, I hope you will understand:

- What sustainability means
- How improving Food Safety can improve sustainability
- Some examples of how to improve food safety and sustainability

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Sustainability Definition

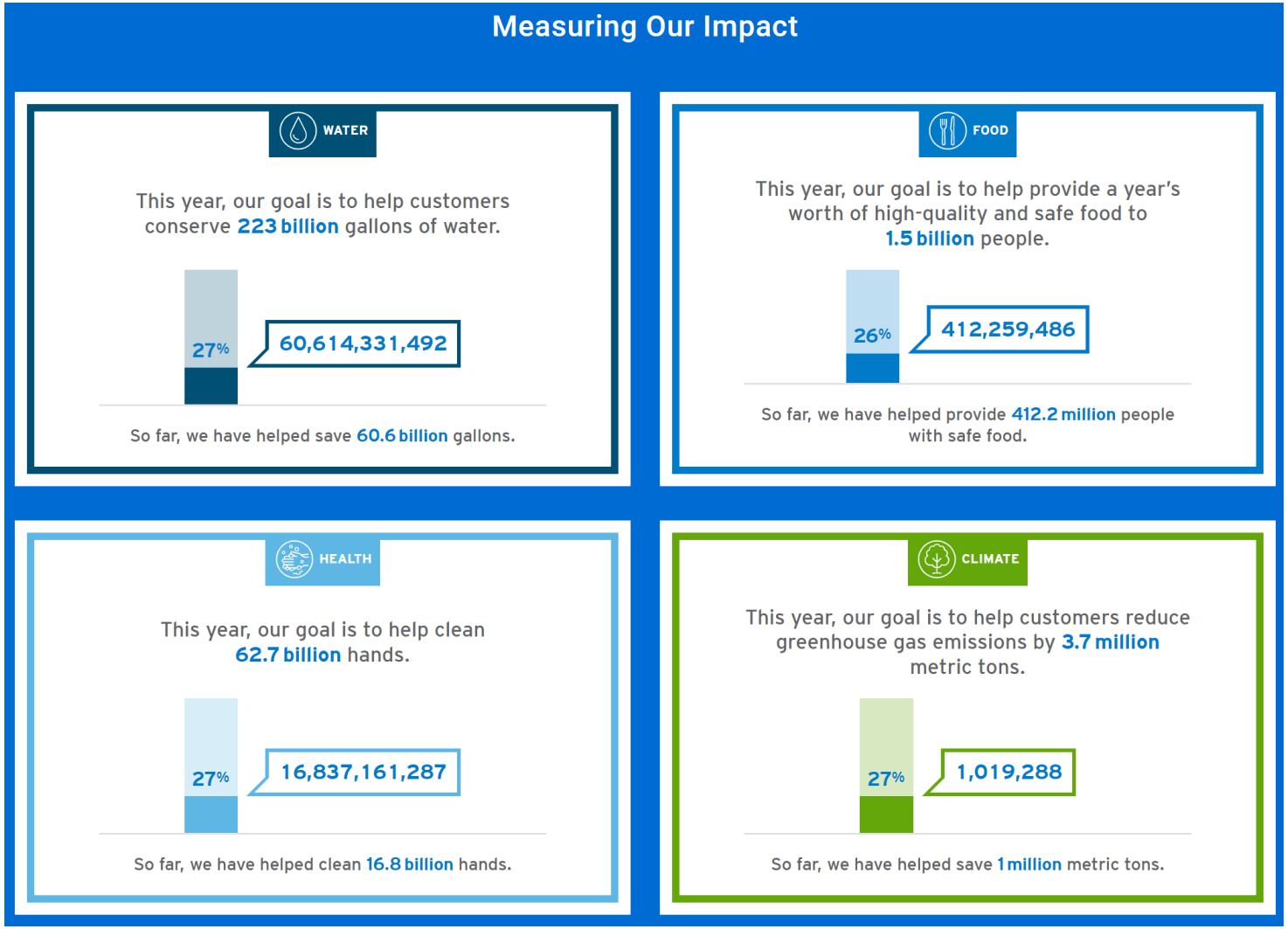
…meets the needs of the present without compromising the ability of future generations to meet their own needs.

Ref: Our Common Future, UN General Assembly 1987, http://www.un-documents.net/ocf-02.htm

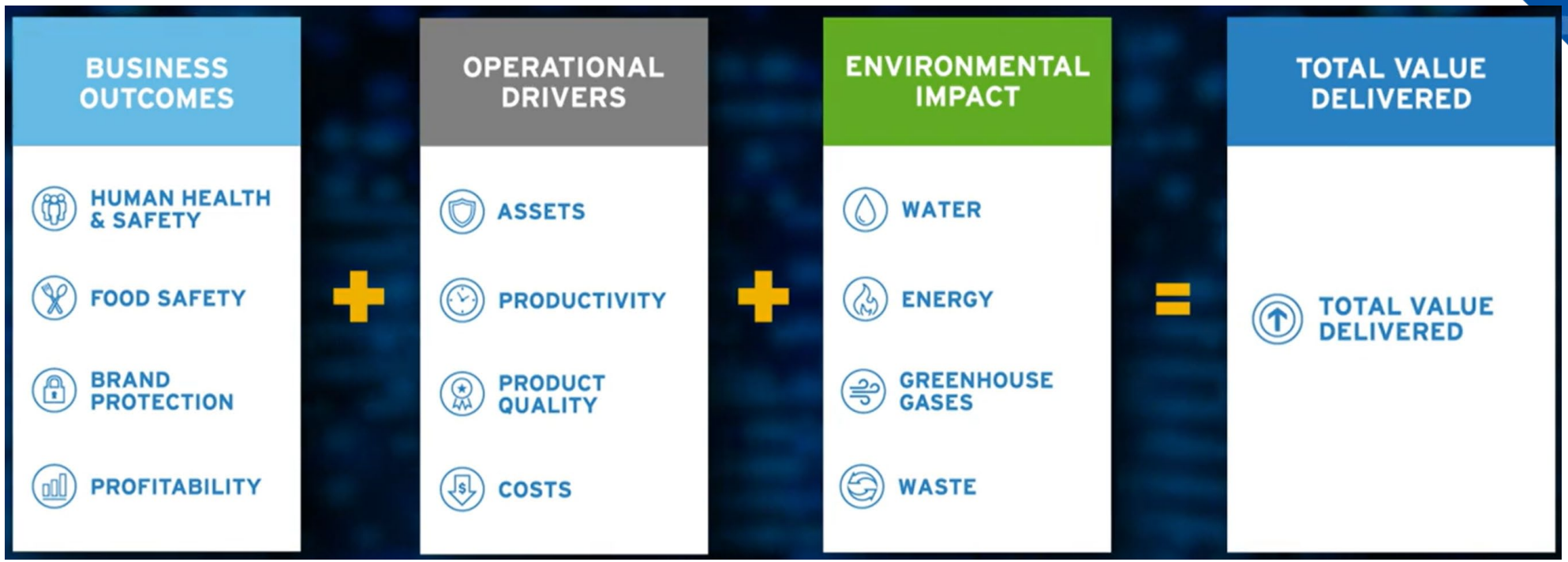
What is causing the focus?

- Environmental awareness
  - Reflect customer and worker values
- Climate changes
- Water availability and cost
- Cost of energy
- Size of the usage in industrial applications
- Complex processes that may lack efficiency / not easy to clean
- Regulations

Our Goals


Measuring Our Impact
WATER
This year, our goal is to help customers conserve 223 billion gallons of water.
27%
60,614,331,492
So far, we have helped save 60.6 billion gallons.
FOOD
This year, our goal is to help provide a year's worth of high-quality and safe food to 1.5 billion people.
26%
412,259,486
So far, we have helped provide 412.2 million people with safe food.
HEALTH
This year, our goal is to help clean 62.7 billion hands.
27%
16,837,161,287
So far, we have helped clean 16.8 billion hands.
CLIMATE
This year, our goal is to help customers reduce greenhouse gas emissions by 3.7 million metric tons.
27%
1,019,288
So far, we have helped save 1 million metric tons.

Calculating Outcomes



Key Concepts

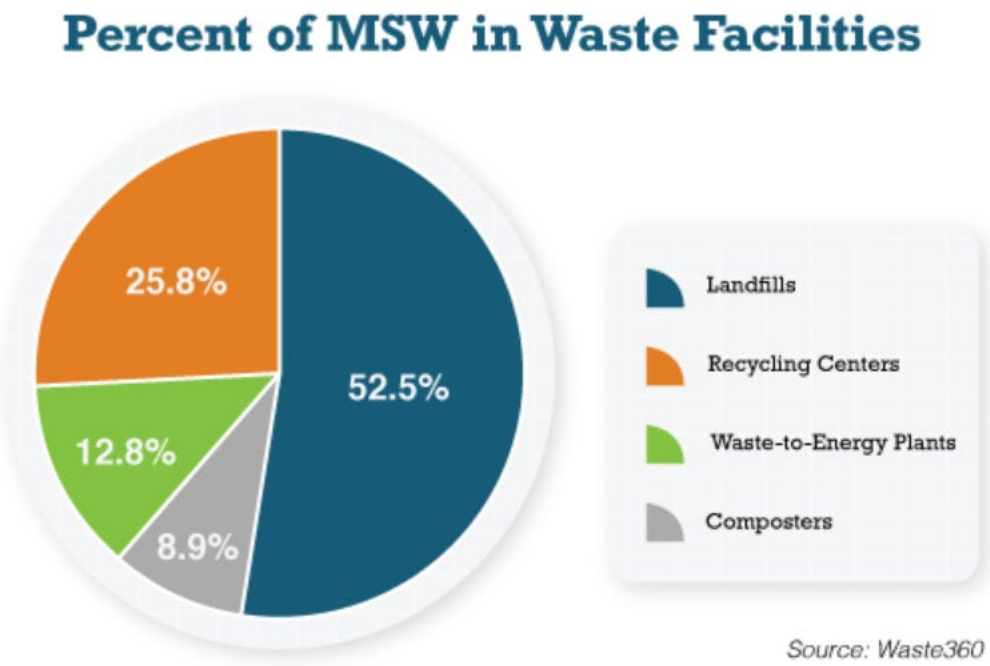
Wasted energy, water, materials, landfill

Not making the best use of time or resources

Higher risk of contamination or longer time for growth

Efforts to improve sustainability can also improve food safety

Where Does Waste Go?



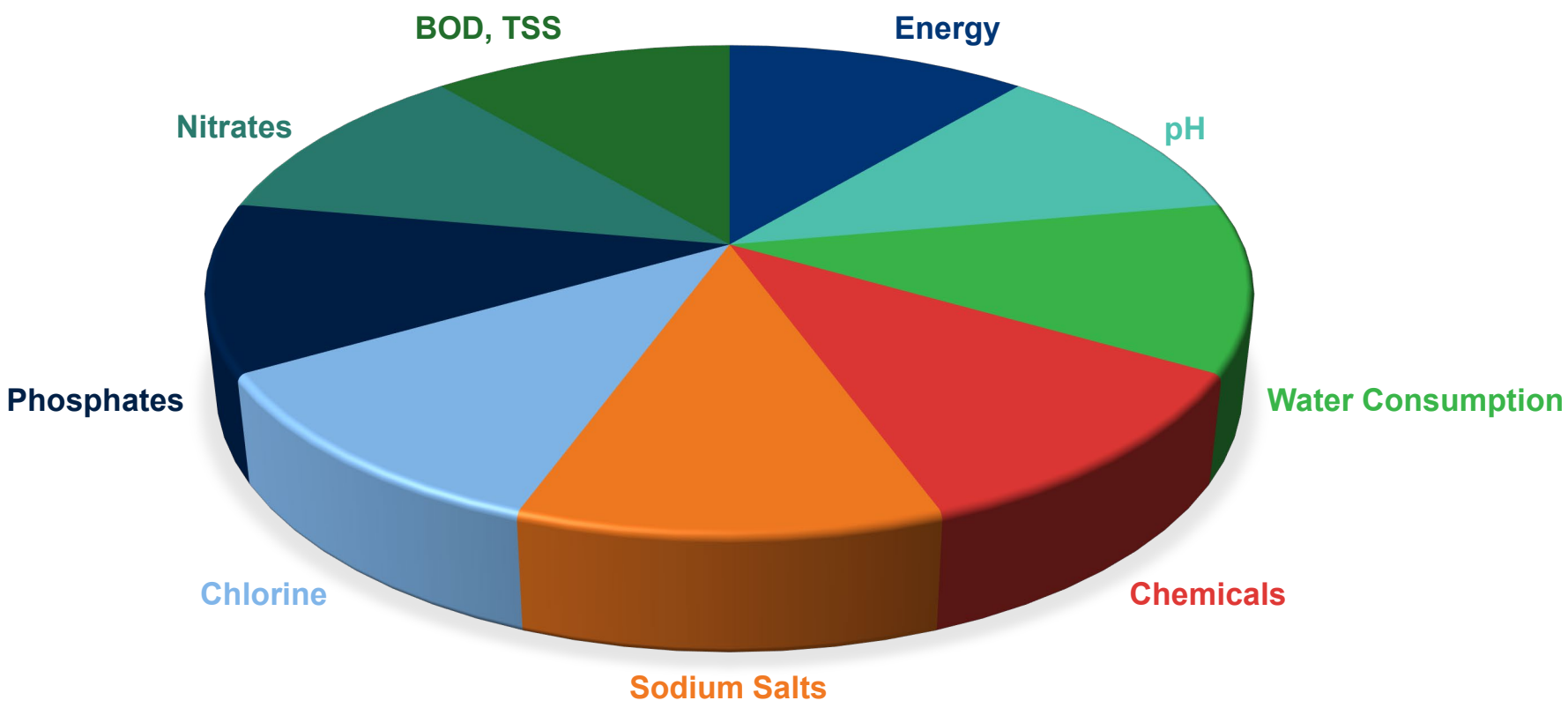
Source: Waste360

Municipal Solid Waste (Trash) primarily ends up in landfills

Find the Right Solution

- Address customer goals
  - Talk with sustainability leaders at customer
  - Measure baseline and results
- Must be effective
- Economical

Environmental Factors



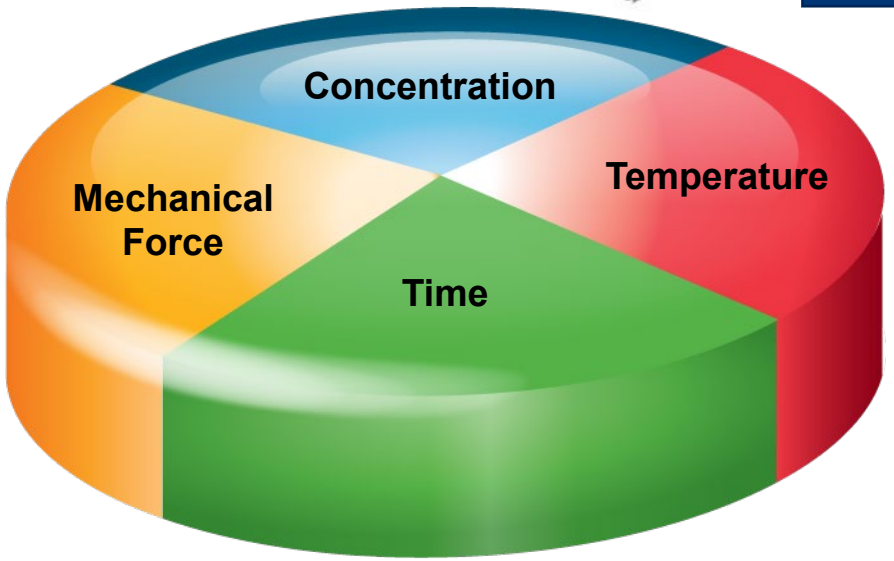
How do we achieve it?

EVALUATE REDUCE RE-USE RECYCLE CONFIRM

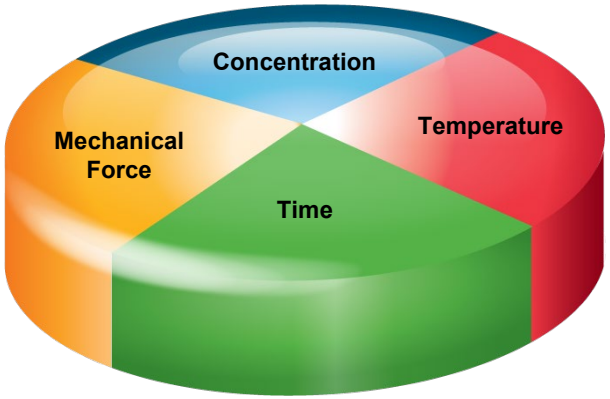
How to Improve

Sanitary Design

Reduce



Better sanitary design means easier to clean



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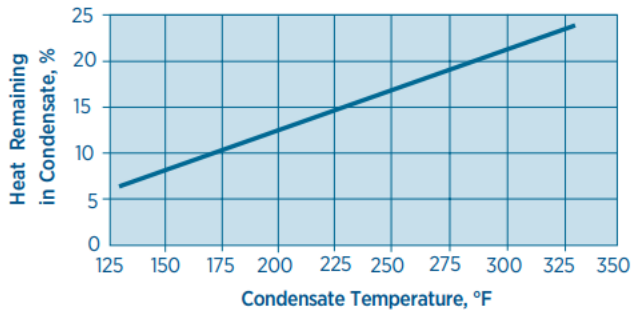
Water

- Critical Resource
- Lifeblood of the cleaning system
- Pre-rinses
- Wash water make-up
- Post-rinses
- Sanitizer water
- Cow water
- Dry cleaning?

Energy Consumption

- Often ignored
- Electrical power - supply / return pumps
- Steam
- Condensate return
- Time – reduce time / reduce energy consumption
- Reduce water – reduce energy

$$kW = P_1 \times \frac{746}{(1000 \times efficiency_{pump})}$$



Let:

h_c = enthalpy of condensate at 180°F = 148 Btu/lb
h_m = enthalpy of makeup water at 55°F = 23 Btu/lb
h_s = enthalpy of steam at 100 psig = 1,189 Btu/lb

Heat remaining in condensate (%):

$= (h_c - h_m)/(h_s - h_m) \times 100$
$= (148 - 23)/(1{,}189 - 23) \times 100 = 11.0\%$

Energy Consumption

- Verify that the sanitation process is occurring as designed
- Optimized sanitation means we are cleaning as needed and not wasting additional resources
- Cleaning for too long means additional wear on components which can be a food safety risk

ECOLAB Food and Beverage Division

CIP Verification Form

Customer		Account #		Date:	
Object being Cleaned :		CIP System:		Type	Re-Use
Review system with operating personnel and/or management to determine if any abnormal conditions or problems have been encountered.					Unacceptable
Review historical CIP documentation for anomalies (Charts, Trends, Logs, titration records) to ensure system performance. Document variance on time, temperature, flow, concentration to standard. Verify if MOC is documented.					Unacceptable
Inspect CIP and process equipment, chemical feed system, and control equipment for general operating condition and appearance. Check detergent supply before starting to monitor the CIP system. Review PM Program (gasket checks, pumps, hoses, valves, devices).					Unacceptable
Review Water Analysis Report. Ensure the water source is accurate and current. Note potential issues in comments section.					Unacceptable
CIP Preparation completed (Filter/Strainer, Dead-ends, Manual Cleaning, Spray Device Check, Refrigeration, Agitator…)					Unacceptable

Maximum pipe diameter		in	
Spray Device Capacity		gpm	
CIP Supply pump			
Motor Horsepower:		RPM	

Tube Size	Diameter	Radius	5 ft/sec	6 ft/sec	7 ft/sec	8 ft/sec
1.5	1.37	0.685	23	28	32	37
2	1.87	0.935	43	51	60	68
2.5	2.37	1.185	69	82	96	110

Sanitation Prep

- Sanitation prep is a food safety consideration added to the 4x4 sanitation process
- The dry/gross pick-up helps reduce the work the chemicals and water must do and allows us to use less

1. Sanitation Prep
2. Pre-Rinse
3. Wash
    1. Concentration
    2. Temperature
    3. Time
    4. Mechanical Force
4. Rinse & Inspect
5. Remove Water & Assemble
6. Pre-Op Inspection & Verification
7. Sanitize

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Sanitation Prep

- Waiting too long before beginning to clean is a food safety and sustainability concern
  - Dried soils are harder to clean
  - Too much time before sanitation and microorganisms could grow

Proactive Food Safety Reduces Waste

- Food with known food safety risks will often end up as landfill
- Helping identify food safety risks by doing walk-through assessments and mentioning some of the food safety concerns you have learned
- Addressing food safety risks early can prevent product from ending up in a landfill

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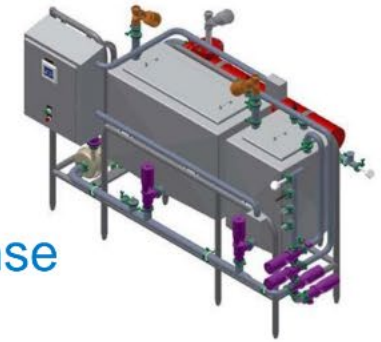
Recovered Cleaning Solutions

- Re-Use CIP
  - Re-use of wash solution (alkaline and/or acid depended on application)
  - Can be 2,3 or more tanks
  - Economical and efficient
  - Food Safety/Cross Contamination concern related to washing equipment processing allergens and recapturing wash solution
- Rinse Recovery
  - Addition of a tank to collect post rinse water for use in pre-rinsing on other cleaning cycles
  - Can be added to Re-Use or Single Use systems
  - Provides added efficiency by using rinse water twice before discharging
  - Food Safety/Cross Contamination concern increases with rinse water being collected for use on other cleaning cycles



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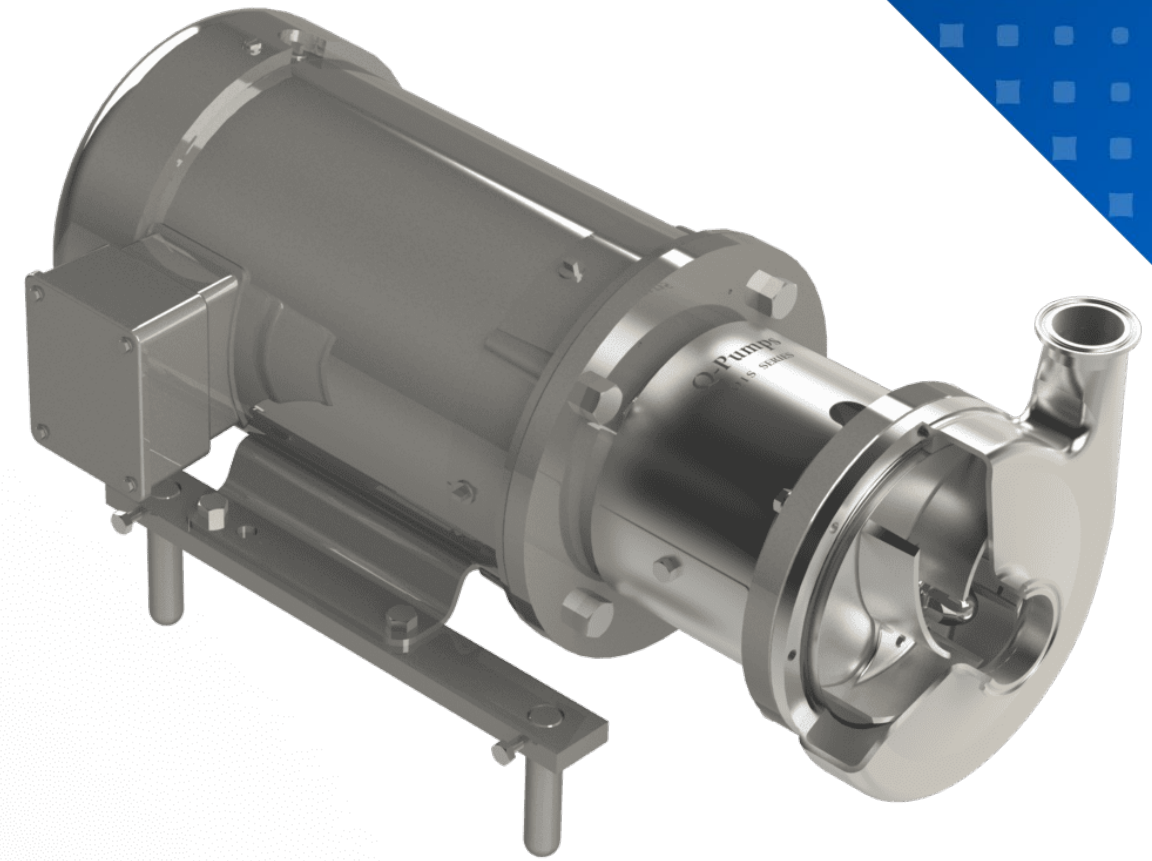
Recovered Process Water

- Condensate from Evaporators
- Permeate from UF / RO filtration
- Proper storage to prevent contamination
- Isolated from potable water supplies
- Uses:
  - Pre-Rinses
  - Wash water make-up
- Gallon used is a gallon saved - in & out

VFDs

- Variable Frequency Drives
- Delete throttling valves
- Balance the system
- Reduce power consumption
- Reduce noise
- Verify flow rates



Vortex Breakers

- Tanks designed for process - not CIP
- Too often ignored - lack of awareness
- Reduces time
- Reduces water
- Reduces chemical
- Reduces steam
- Improves cleaning
- Improves sanitizing

Vortex

Equipment Technologies

- Automation and digitization
  - Assisted Cleaning Systems
  - 3D TRASAR CIP
  - Ecolab engineering solutions
- Tanker – Rotary sprays
- Cabinet Washers

Automation

- Controlled Cleaning Cycles
- Cycle Verification
- Repeatable Process
- Reduce Time / Chemicals
- Reduce Water

Remote CIP Monitoring and Control

Advance your goals - from data points to performance reality.

✓productivity ✓risk mitigation ✓sustainability ✓product quality

3D TRASAR CIP is now easier to use and delivers even more insights to help you achieve your goals.

The cloud-based digital platform that helps you efficiently handle increasing regulatory pressure, stricter food safety and audit requirements, and a changing workforce.

Now 3D TRASAR CIP provides greater visibility to risk areas and even more actionable information.

Continuing Ecolab's proven heritage of industry-leading innovation and expertise, the new 3D TRASAR CIP delivers more power to minimize risk, stay on top of ever increasing regulatory and food safety pressures and position yourself to meet unpredictable audits with ease.

Responsive dashboards allow everywhere-access to your data.

Engineering Solutions

Engineering Solutions

Ecolab Engineering's total solution approach ties chemistry, design, and equipment to deliver your desired outcome.

Related Programs

F&B Sales Support

Bulk Program

Nelson, Sonja
Edited February 24

F&B Sales Support

CIP Solutions

Kelley, Lauren
Edited July 1, 2021

F&B Sales Support

COP Solutions

Johnson, Barbara
Edited June 25, 2021

Tanker Sprays

- Improved Cleaning
- Reduce Water
- Reduce Time / Chemicals
- Reduce Steam
- 74 GPM @ 60 psi vs.
- 120 GPM @ 55 psi

Cabinet Washers

- Replace COP Tanks
- Cycle Verification
- Repeatable Process
- Reduce Time / Chemicals
- Reduce Water 90%

More reading

https://ucfoodsafety.ucdavis.edu/sites/g/files/dgvnsk7366/files/inline-files/198568.pdf

Co-managing for Food Safety and Ecological Health

https://www.un.org/sustainabledevelopment/sustainable-consumption-production/

UN Sustainable Consumption and Production Patterns

https://www.ecolab.com/corporate-responsibility/2030-impact-goals

Ecolab 2030 Impact Goals

Questions?

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