Sustainability and cost savings in craft bourbon production

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The James B. Beam Institute for Kentucky Spirits at UK (JBBI) is leading the global advancement of the American whiskey industry through workforce education, scientific discovery, environmental sustainability, community and social responsibility

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Sustainability means many things

More than any other industry, the production of aged spirits requires a long-term vision of success that encompasses several aspects of corporate sustainability:

- Social
- Economic
- Environmental

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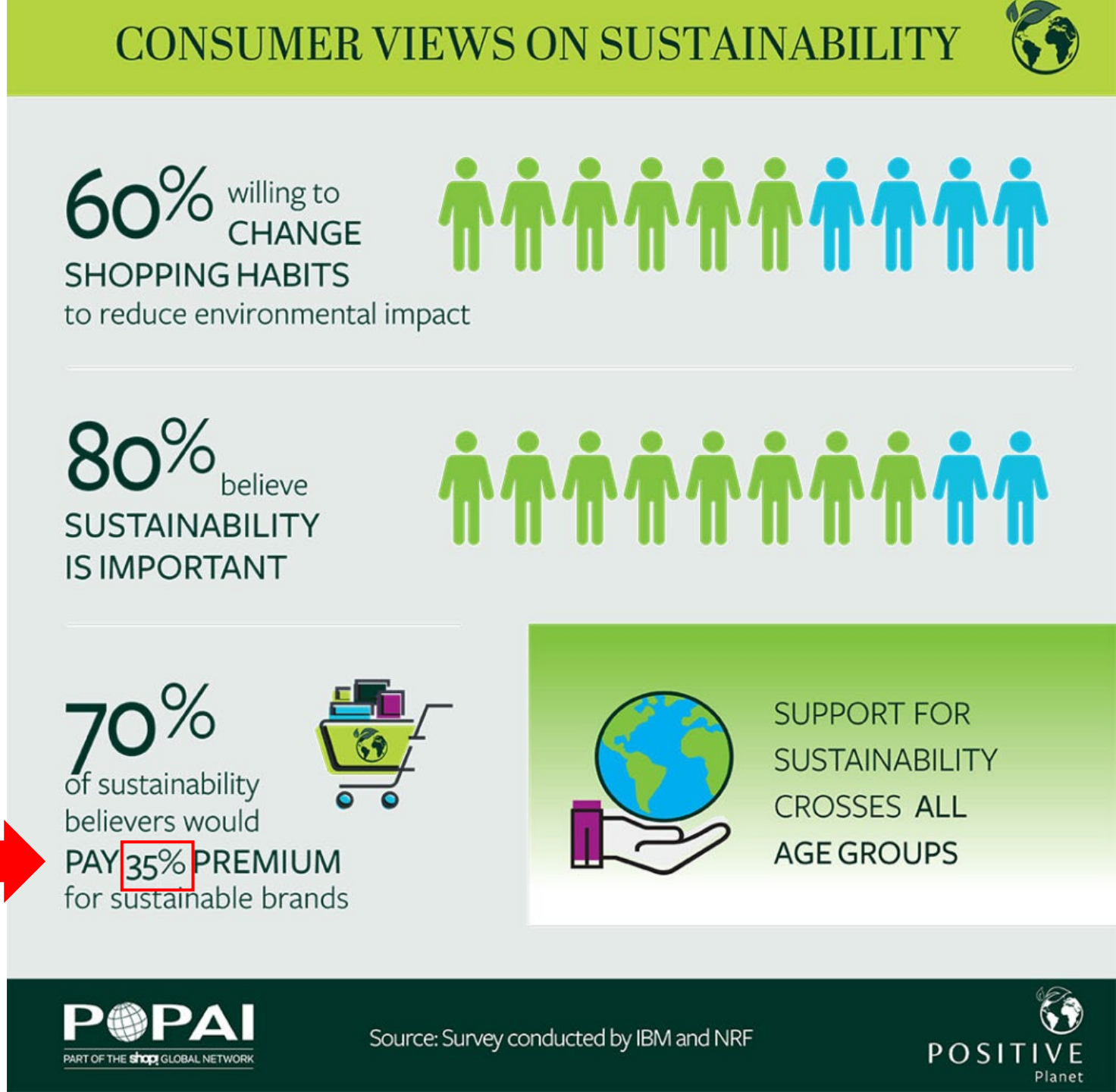
Sustainability can help your market share

- "Shop local" sustainability initiatives help drive craft distillery growth
- Sustainability drives consumer choice
- Ultimately, a **strategic business decision**



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Best practices for energy efficiency at the craft scale (and beyond!)

- Three key takeaways today:
  - Benchmarking is paramount
  - A case study from distilling: identifying strategies for process intensification
  - Culture is critical for sustainable success

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Benchmarking: Collect the data

- How much energy and water do you use for every unit of product you make?
- Gather up your key data for 12 months:
  - Production volume
  - Gas bills
  - Electric bills
  - Water bills
- Free tools to see where you stand:
  - EnergyStar EPI worksheet
    - How do you compare to similar USA distillers?
    - **Does your industry have EnergyStar guidance?** Check out green certification talks at 11:15 and 3pm
  - KPPC can help – check out their session at 1:45pm

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KPPC
Kentucky's Resource Center for Environmental Sustainability

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Benchmarking: Getting into the details

- You have the big picture, now where to start improving??
- MEASUR from DOE has some useful calculators to help in detailed energy use assessments in your plant
  - Like finding which pumps use the most energy
- It's a bit tricky to use, but we can help!
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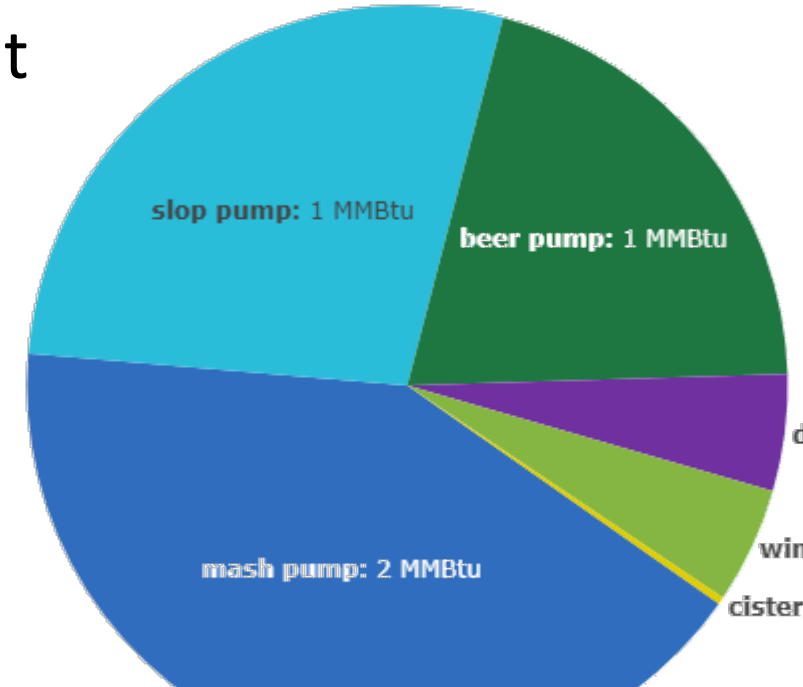

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U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

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Financial resources to help fund improvements

- USDA REAP for some locations

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

- Other opportunities collected by Department of Energy

- Check out talks today for help!
  - Next/now in other breakout session
  - 3pm session

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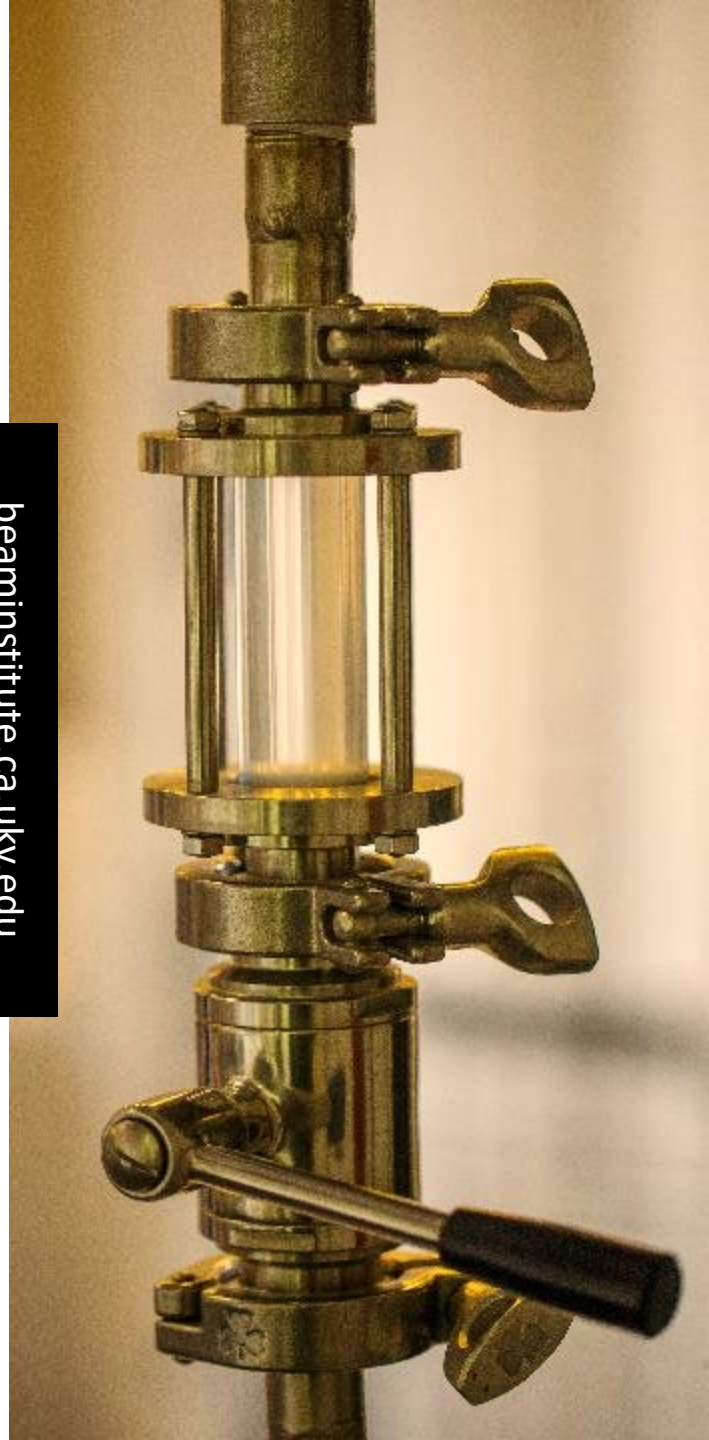

Best practices to save on energy

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Making bourbon

Grow grain

Water intensive

Energy intensive

Mash chiller

Cook

Ferment

Condense

Distill

Distill (again)

Condenser

Barrel & age

Stillage co-product

Distilleries use as much energy as breweries!

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Many options to save on operations… I'll limit myself today

- Maximize throughput – continuous > batch
  - Optimize your processing steps
- Insulation – costs a little, saves a lot
- Build a team-driven culture of sustainability

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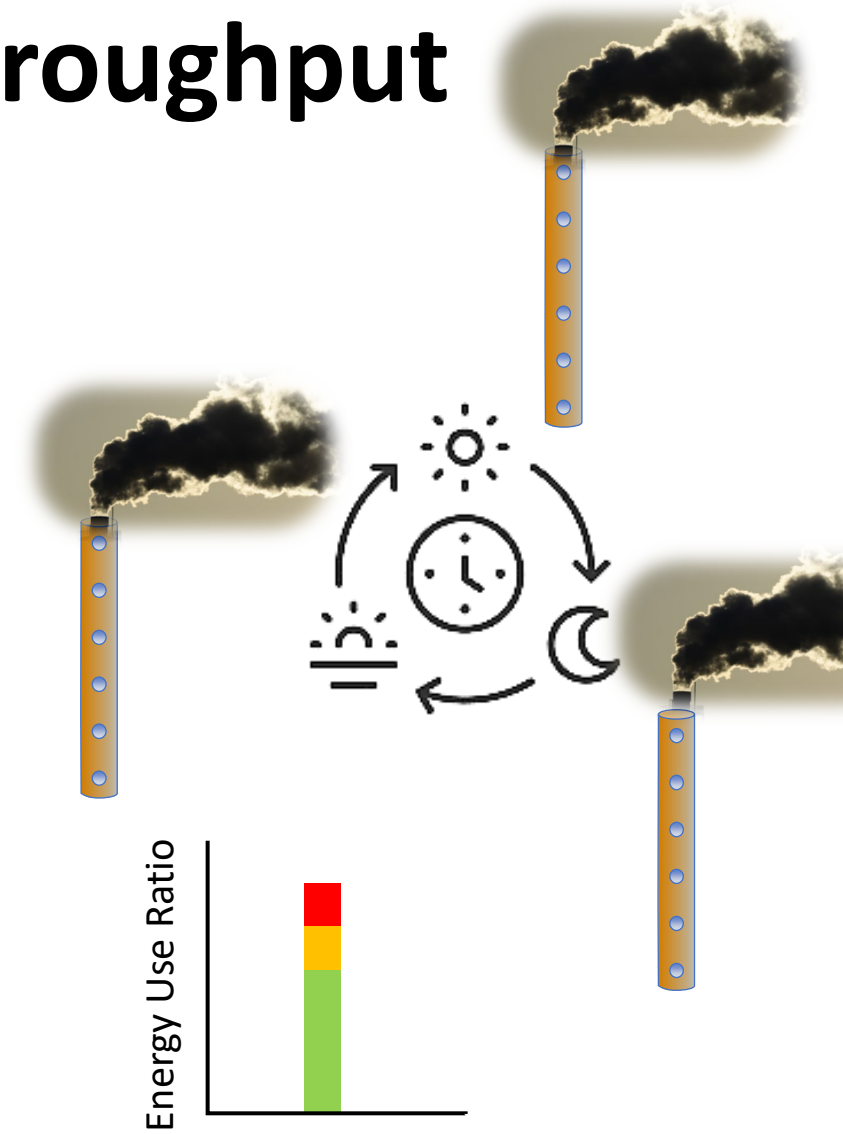
Maximize your throughput

- Daily startup & shutdown wastes a lot of energy
  - More energy spent warming up equipment
- The closer you can get to 24/7 operation, the more efficient you'll be
  - Case study: can boost production by 60% while increasing energy by only 20%



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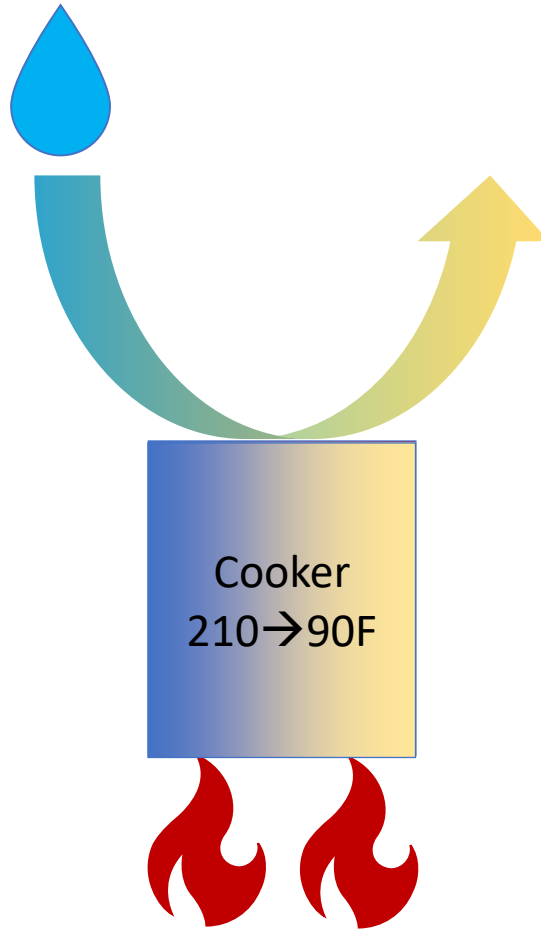
An example from distilling: Cooking uses a lot of resources

- Cooking grains for whiskey takes a lot of energy!
- Maximize backset to save water and heating energy
  - Potentially up to 33% backset without impacting quality
- Cooling so it's safe for yeast takes a lot of water/energy too
  - Can you find a thermotolerant yeast to pitch at higher temp, up to 100°F?



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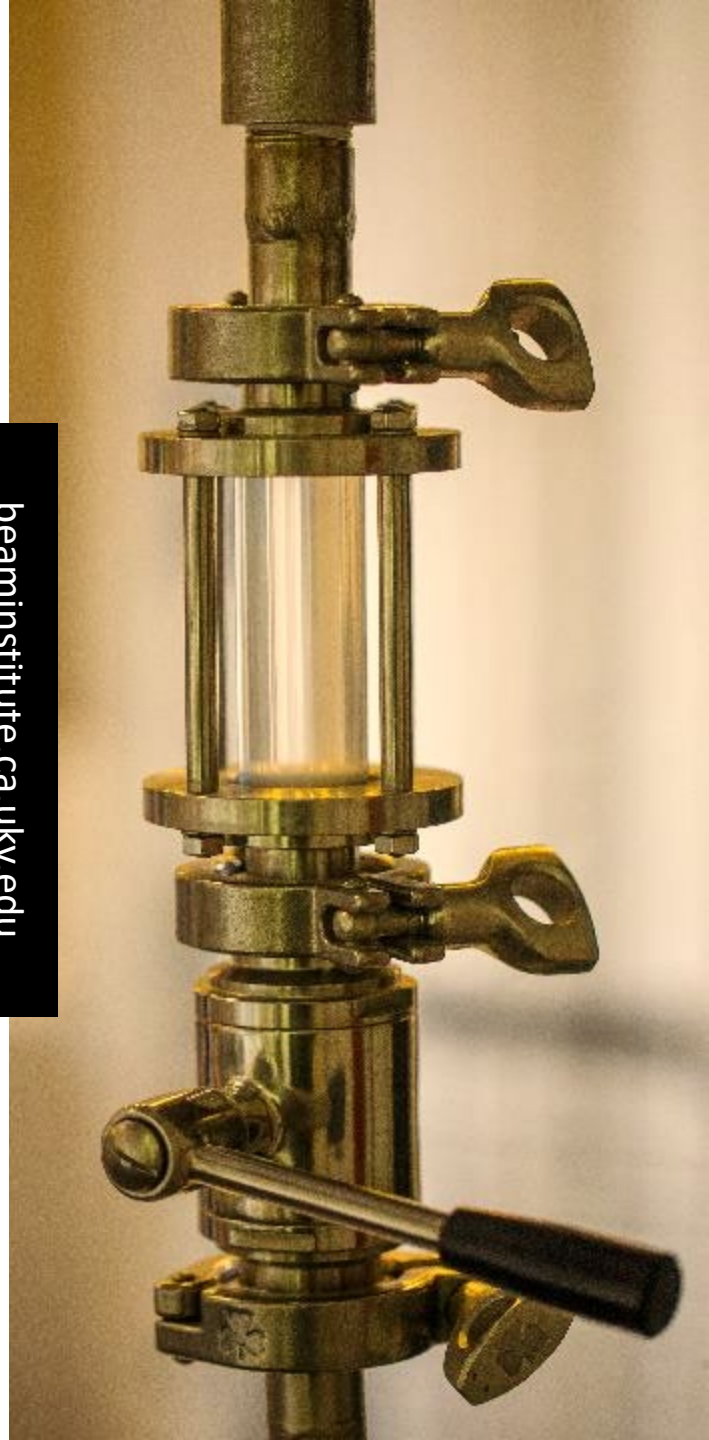
The process of optimizing

- Work with enzyme, yeast suppliers – they can help you find the solution for YOUR process
- Got an idea?
  Try it out and see how it goes!
  Benchmark your changes:
  - Energy use
  - Water use
  - Sensory/quality



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Insulation is an easy win

- Low up-front cost, easy to install, saves a lot of energy
  - Reduces steam distribution losses by **~90%**
  - Typical **payback** period of only **1 year**
- Safer for your team and visitors
- Beam Institute can help survey best places to insulate with our thermal camera!
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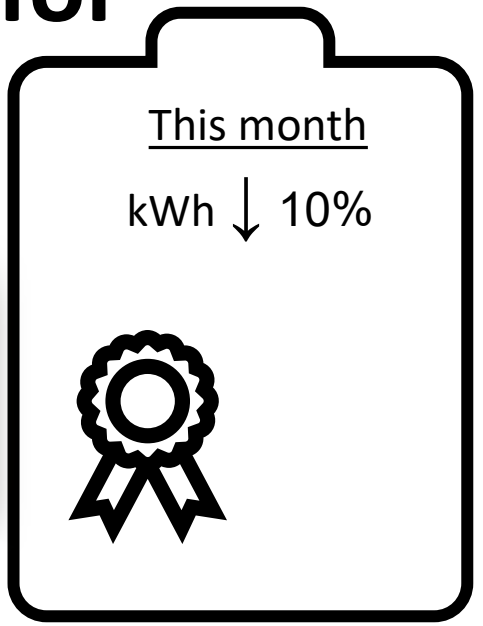
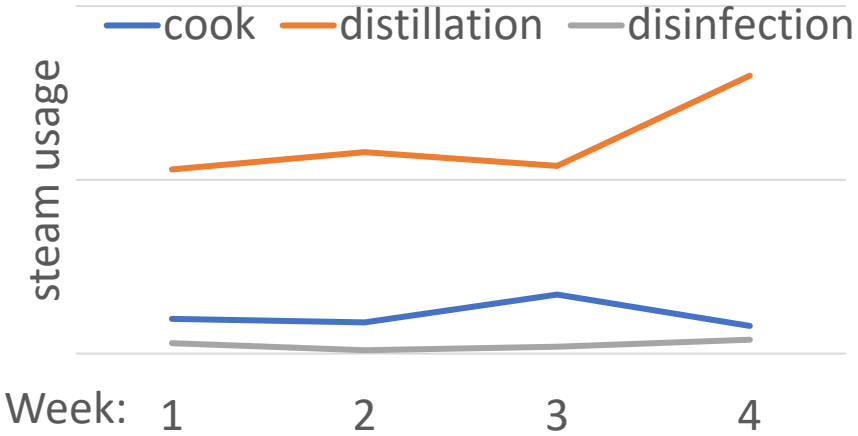
Build a sustainable culture for continued future success

- Can you collect data and share with your team on a weekly or daily basis?
- "Sustainability squads" can be great for team building, leveraging team expertise to save on energy and utilities
- Most importantly: **listen to your team and keep improving**





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Free tools for building a plan

- ISO-50001 is a standard for energy management
- Lawrence-Berkeley national lab has free online tool to build your plan

50001 Ready
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- Check out green certification talks at 11:15 and 3pm!
  - ISO-14001 is another option

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Key takeaways:

- *Benchmarking is the start to building your roadmap for savings*
- *You can save on energy without a lot of expensive new equipment*
- *Continuous improvement culture builds a sustainable future for your brand*

To learn more, visit https://beaminstitute.ca.uky.edu/sustainability

Email me if you'd like me to come out for a site visit and sustainability workshop!
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Stick around for Q&A with session speakers!

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