UNORDINARY
DRIVES
CHANGE

novo nordisk®

Energy and Water at Novo Nordisk

Mapping and Savings

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Novo Nordisk at a **glance**

Novo Nordisk is a leading global healthcare company, founded in 1923 and headquartered in Denmark.

Our purpose is to drive change to defeat serious chronic diseases, built upon our heritage in diabetes.

We do so by pioneering scientific breakthroughs, expanding access to our medicines, and working to prevent and ultimately cure disease.

1. https://companiesmarketcap.com/pharmaceuticals/largest -pharmaceutical -companies-by-market-cap/ (As of 6 August 2025).

Supplier of nearly **50%** of the world's insulin

Net sales **290.4** billion DKK

Affiliates in **80** countries

Investing more than **52** billion DKK in R&D

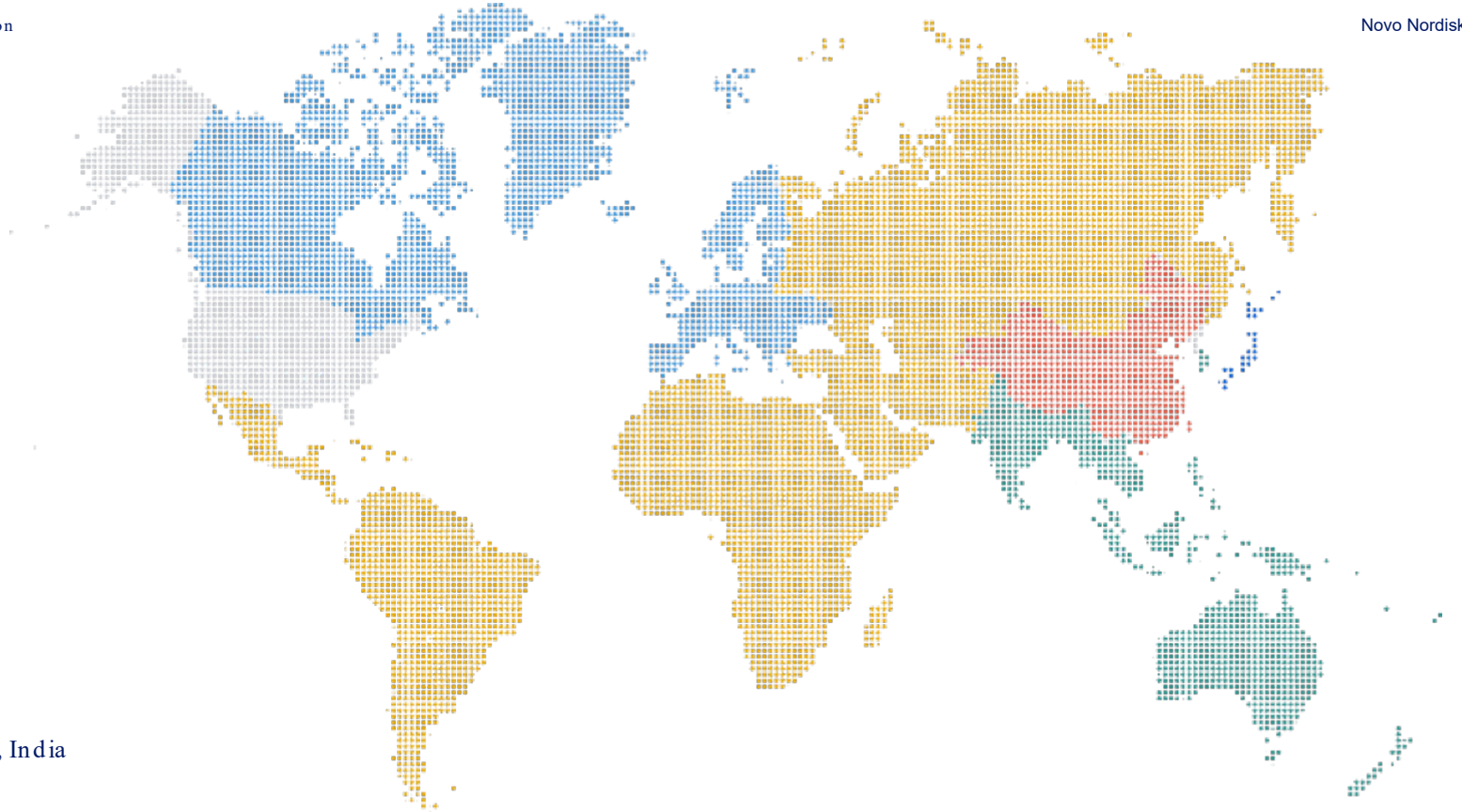
R&D facilities in China, Denmark, UK, US and India

Strategic production sites in Belgium, Brazil, China, Denmark, France, Italy and US

Globally, serving more than **45.2** **million people** living with serious chronic diseases

A top ten pharma company measured by market value [1]

Our **global** presence



Corporate headquarters
Bagsværd, Denmark

US Operations HQ
Plainsboro, NJ, US

International Operations HQ
Zurich, Switzerland

Strategic production sites
Belgium, Brazil, China, Denmark, France, Italy, **US**

R&D facilities
China, Denmark, UK, US, India

Regional offices
- Beijing (Region China)
- Tokyo (Region Japan)
- Copenhagen (Region Europe & Canada)
- Zurich (Region Emerging Markets)
- Singapore (Region Asia & Pacific)

80 countries with affiliates

Novo Nordisk

Product Supply in North Carolina & Virginia

Since **1993**, North Carolina has been part of Novo Nordisk's strategic product supply sites, making significant contributions to community, civic, and education organizations in the state.

Novo Nordisk Pharmaceutical Industries, LP (NNPILP) is the legal entity that includes all U.S. Product Supply sites in North Carolina and now…Virginia! We acquired a small molecule API facility in Petersburg at the end of 2024!

More than

31

years manufacturing in North Carolina

More than

$10B

in manufacturing expansions in NC since 1993

Products shipped to

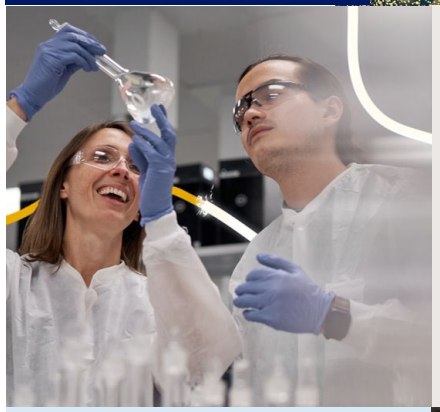
60+

countries worldwide

2025 Business of the Year Pinnacle Award Winner

NC COMMUNITY COLLEGES CREATING SUCCESS

NC COMMUNITY COLLEGES FOUNDATION



Sustainably designed manufacturing facilities

U.S. GREEN BUILDING COUNCIL LEED GOLD USGBC

Gold LEED Certified on all API buildings

Triangle Business Journal

2024 Life Sciences Company of the Year

Donations to universities and community colleges in NC

$40M+

to support research and workforce development programs

Novo Nordisk in North Carolina

- Owns and operates 4 manufacturing facilities in the Triangle Region of North Carolina
- North Carolina is the largest Product Supply footprint in the U.S.
- Supplies diabetes and obesity medications for millions of Americans from North Carolina
- Employs more than 2,000 manufacturing professionals
- Over 30 years, Novo Nordisk has invested more than $10.5 Billion USD in capex investments into the North Carolina economy
- Has a strong reputation in North Carolina as a sustainable business, community partner, best-place-to-work, industry leader, etc.

+2m ft²
Facility footprint across 4 facilities (190k m²)

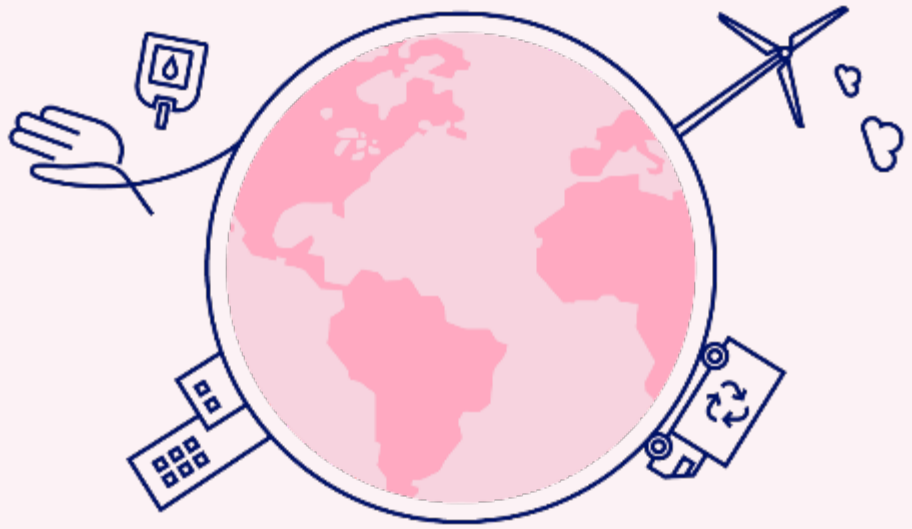
31 years
Operational success in NC

We are focusing on four **must -win battles**

To do *more* for people with less environmental impact, **we are focusing on four must -win battles** where we can really make a difference

#1 | Reach more vulnerable patients with treatment

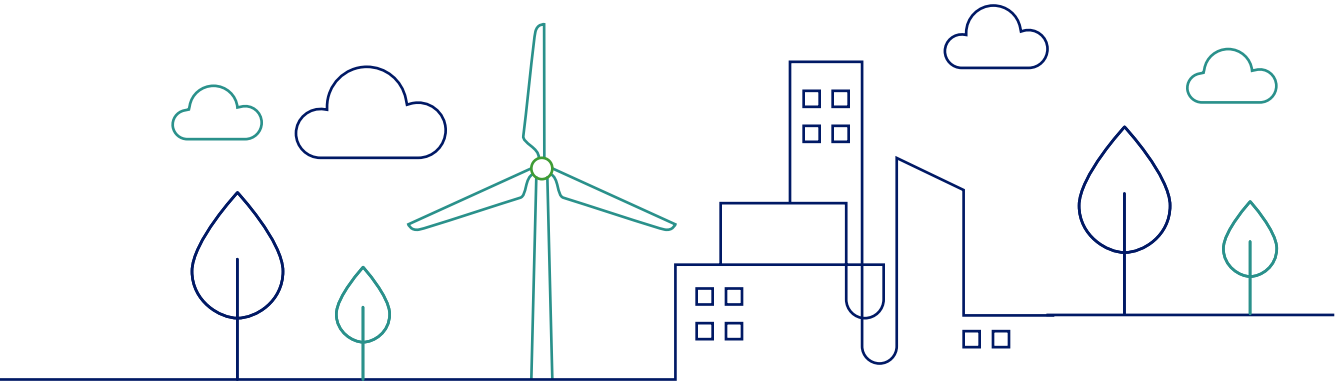
#3 | Reduce CO_2 emissions



#2 | Reach more children with effective prevention solutions

#4 | Reduce the plastic footprint from our products

Must-win challenge
to reduce CO_2 emissions



Targets

Net Zero emissions
by 2045

All supply based on 100%
renewable power by 2030

Zero CO_2 from own operations
and transport by 2030

Driving change as an **environmentally responsible** business

Together, we are driving change to eliminate our environmental footprint. Through our **'Circular for Zero'** strategy, we design and produce our materials so that they can be re-used and reshape our business practices to minimise consumption and eliminate waste by turning it into new resources.

We are embracing a circular mindset – our ambition is to have **zero environmental impact**

Circular supply

Engage with suppliers to minimise the environmental impact from what we buy

Circular company

Reduce the environmental impact from our own operations

Circular products

Minimise the environmental impact from our products, also after use

circular FOR zero

Circular for Zero – Energy and Water Goals

1. Mapping

- API Clayton is working on detailed energy and water mapping for high users on site. We've been working with vendors, interns, and stakeholders from different sites to get input into the total mapping.
- Mapping efforts are a culmination of work by production, utilities, and process modelling groups

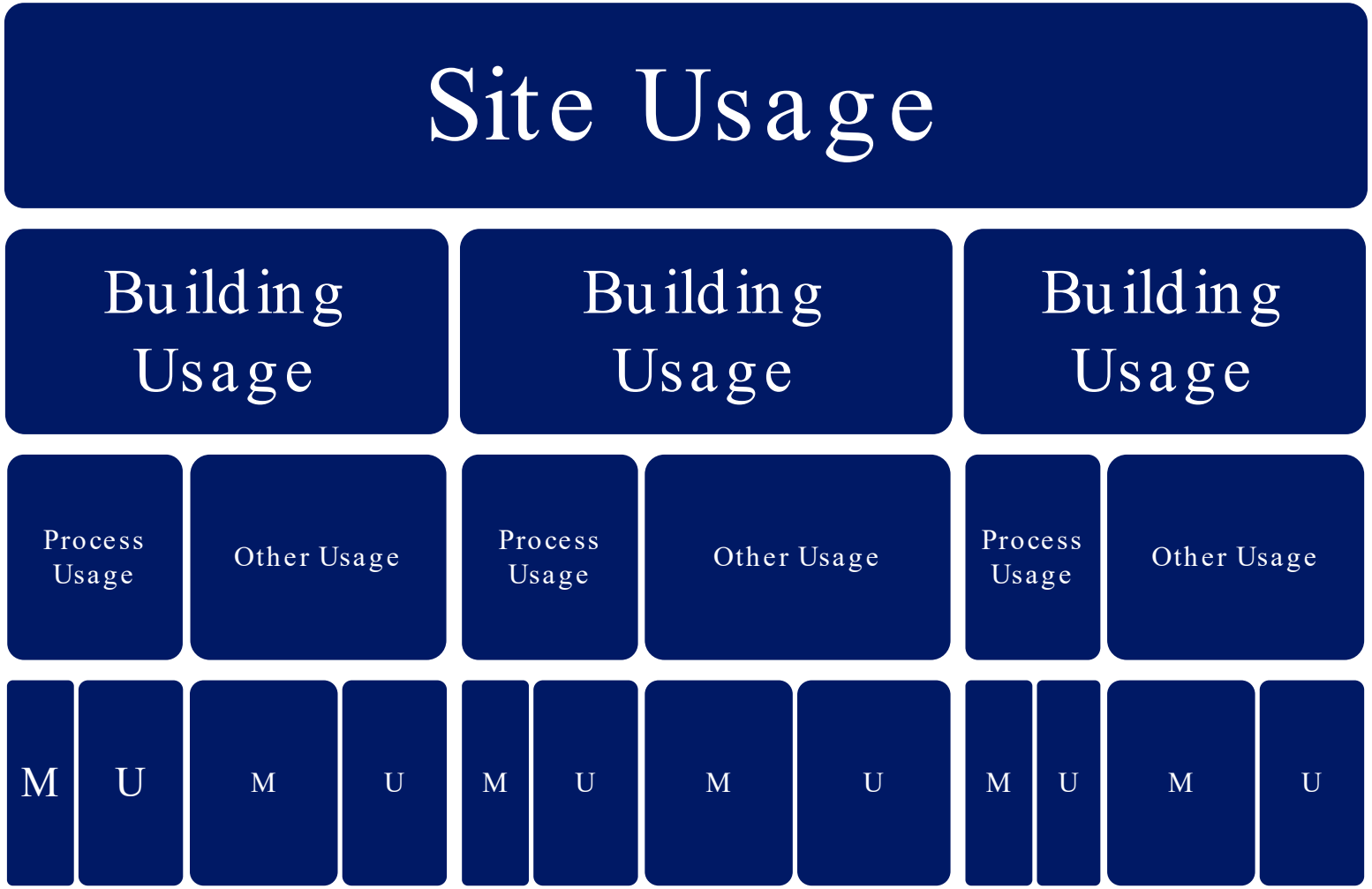
2. Project savings

- Novo Nordisk has a goal of 2% energy and water reduction through projects.
- These projects can be dedicated for savings, process improvements, equipment maintenance or configuration adjustments, among others.

Mapping Strategy – Energy and Water

External Data:
- Invoices
- Vendor Data

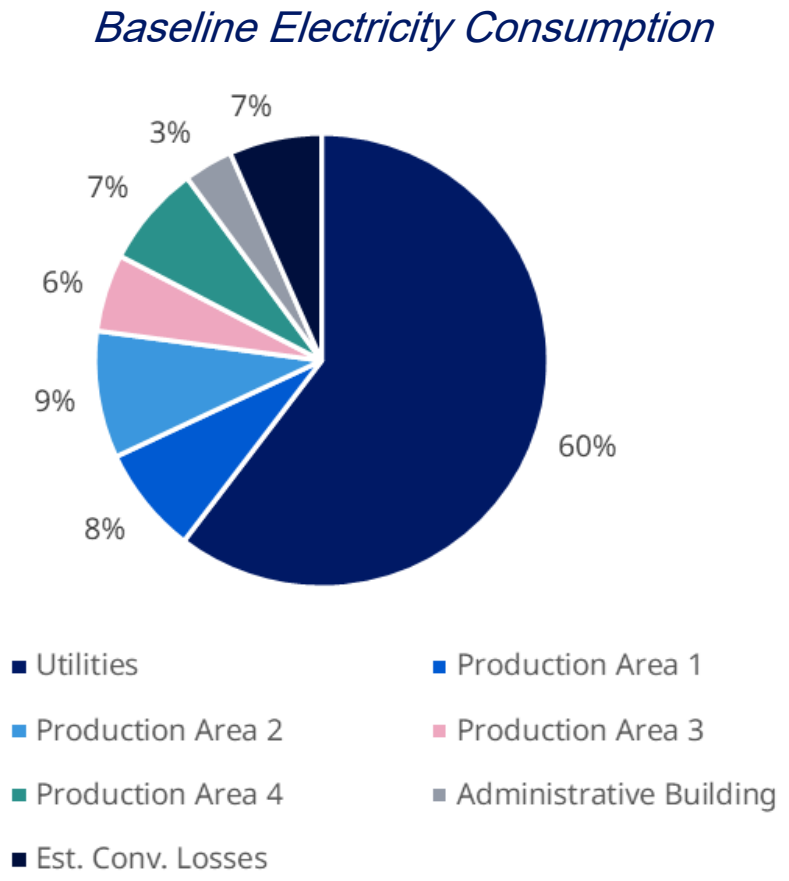
Internal Data:
- Process Data
- Building Monitoring System
- Equipment Specs
- Utilities



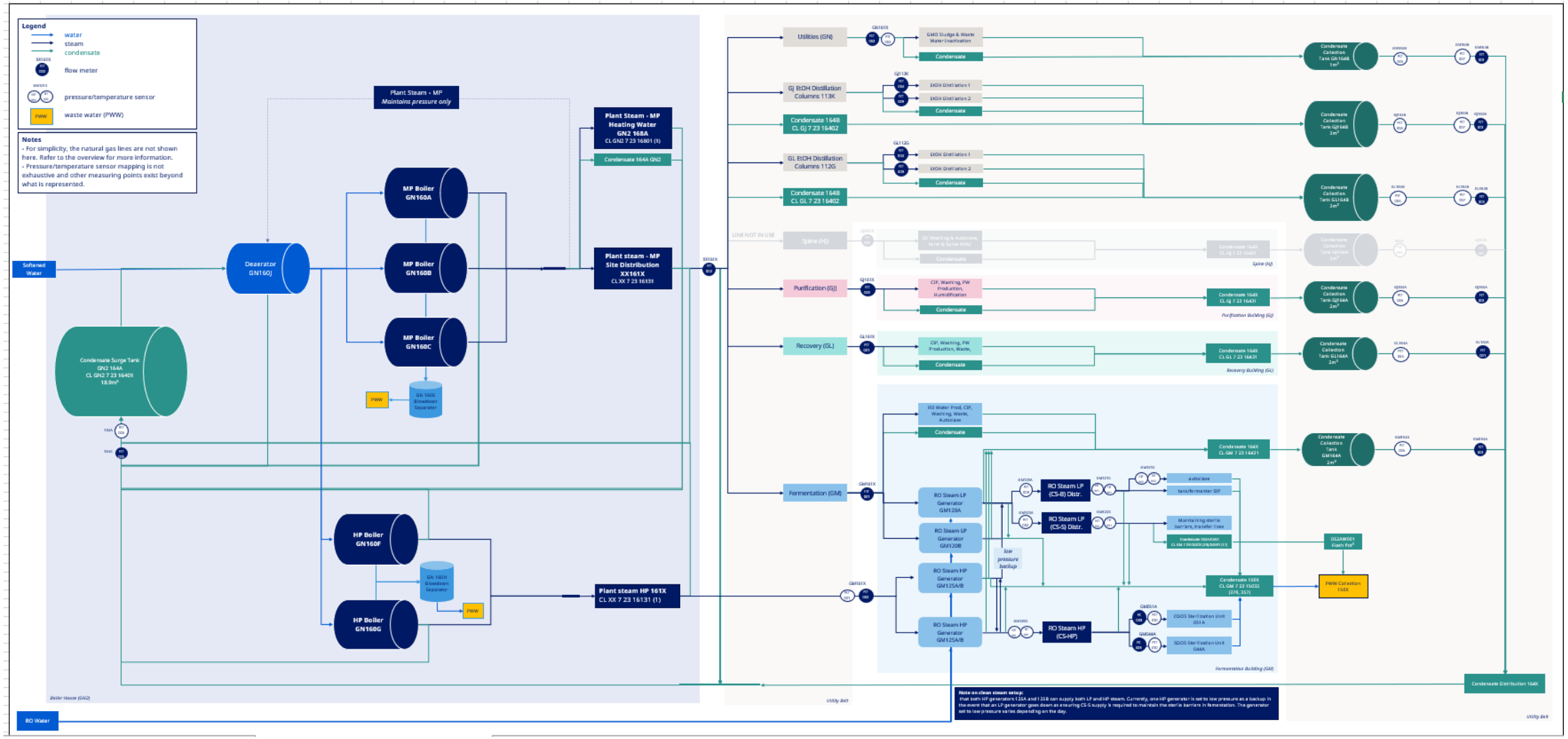
M – Measured U - Unmeasured

Goal - Mapping

- Corporate aspiration to map all energy sources and consumers
- API Clayton has 2 main sources of energy:
  - Electricity and
  - Natural gas/steam
- In 2024, we conducted a baseline energy assessment
- We now have estimates for which areas/equipment are our Significant Energy Users (SEUs)
- The next goal: track our top SEUs for electricity and steam to collect data and develop site-specific KPIs



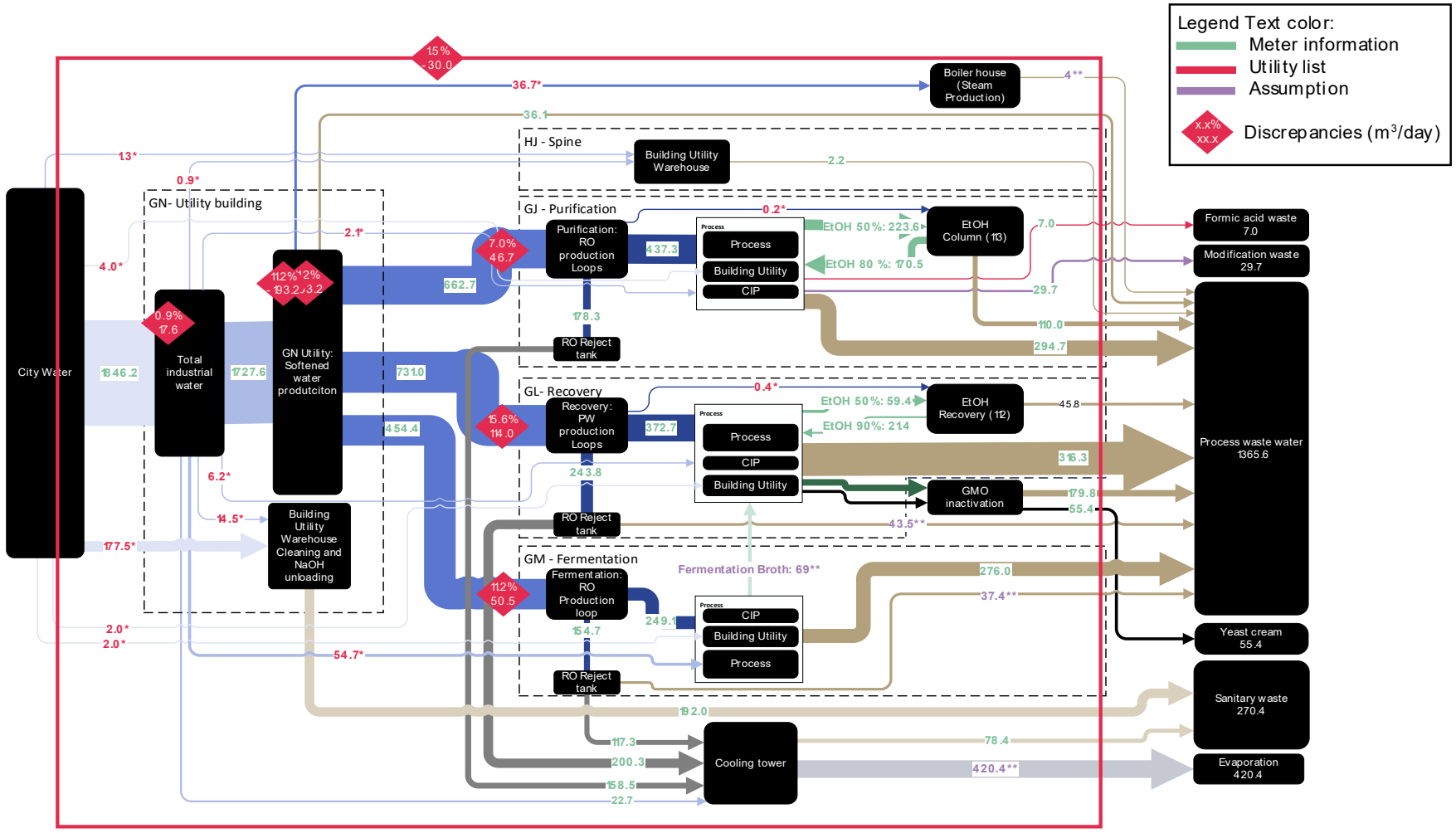
Natural Gas and Steam Example



Water Example – Process Flows

Driver:

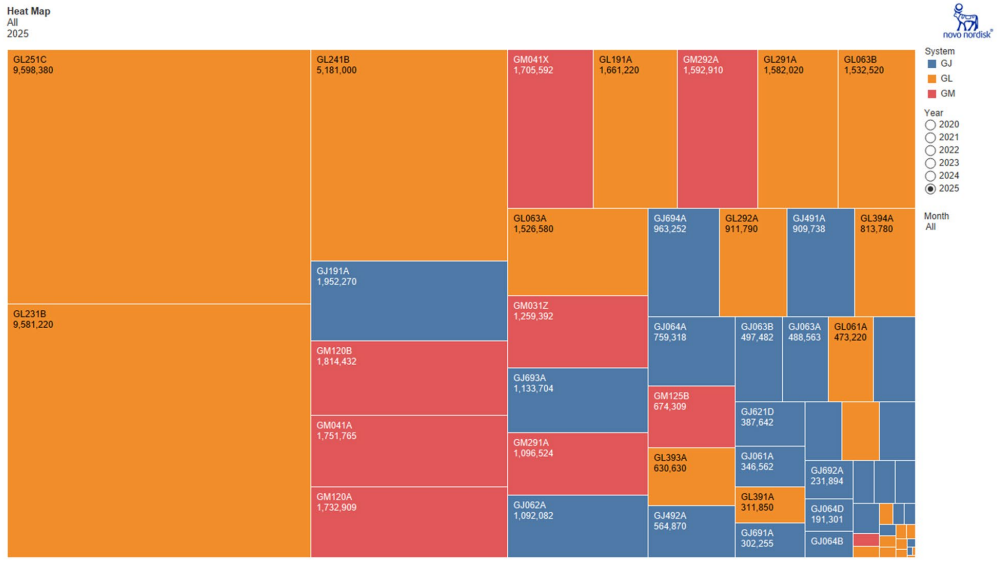
- Identify high water users in the process flow
- Understand process vs. non-process consumers of water
- Understand potential for internal recycle projects

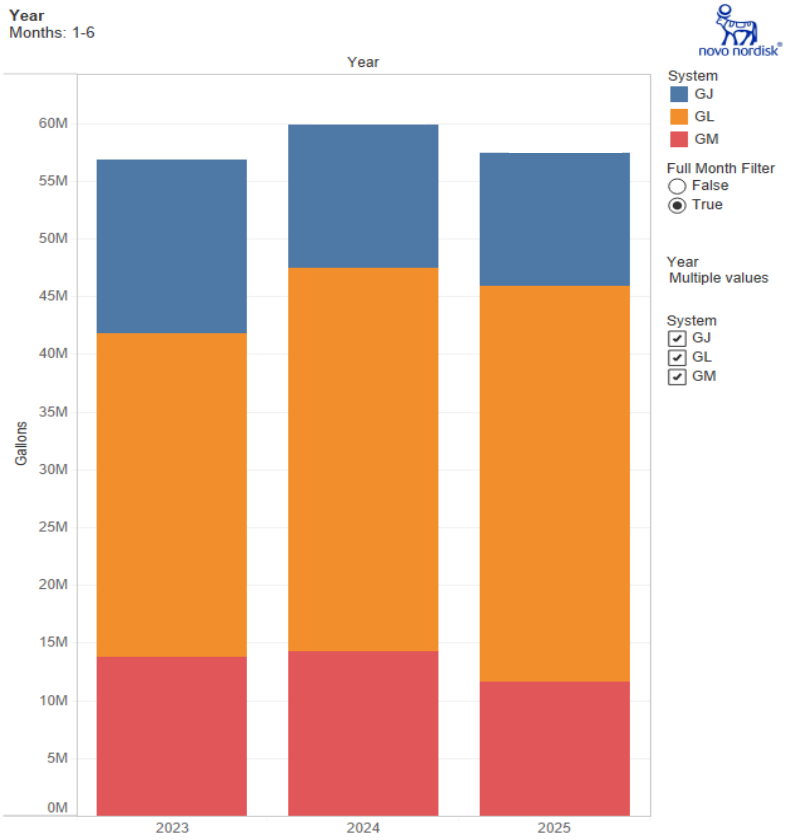


Water Mapping – Visualization

Benefits:

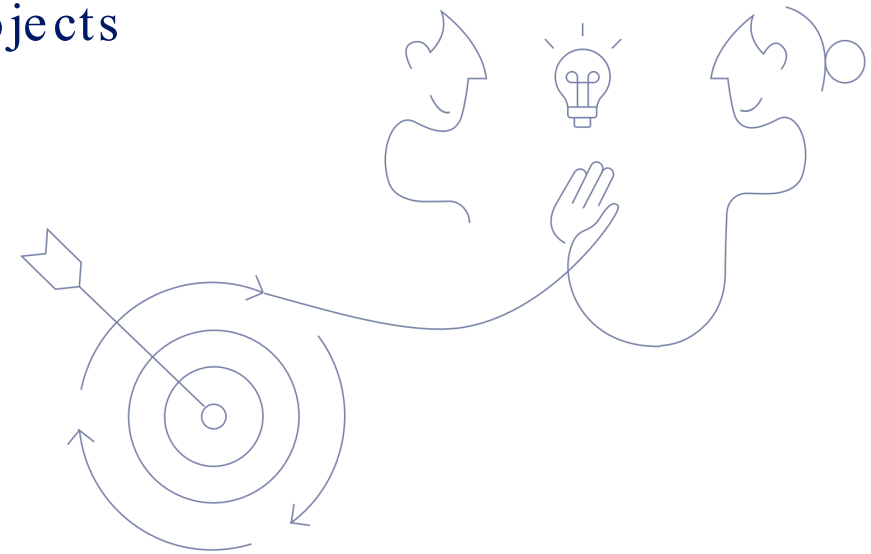
- Quantify high water users by process step to identify opportunities for water savings.
- Track year-over-year performance
- Use data for more accurate future year projections
- Highlight process KPIs to help monitor performance





Mapping through collaboration

- Archiving and visualizing data/KPIs utilizes various tools:
  - For Archiving: PI datalink, building management systems
  - For Visualization: PI Vision, Tableau, Power BI
- To encourage involvement and advocacy, we have quarterly meetings consisting of various stakeholders across production sites
- Using archived data, visualization tools, and stakeholder feedback, we are working to improve visibility of energy use and savings projects



Goal – Project Savings

2% yearly savings is the NN continuous improvement goal

- We receive energy savings projects in various forums, such as project approval meetings and quarterly cross-functional team meetings:
  - Most project are submitted as production improvements, and usually have a water and/or energy savings as a secondary benefit
  - Other projects are driven by sustainability to reduce consumption
  - The target is to use the visualizations we are creating now to identify more high-usage equipment.
- All Energy and Water savings projects are tracked via a corporate database. This database can be used to share ideas and methodologies across plant and around the world.

Energy Savings Project Examples

Inactivation Skid Optimization

- Steam is used to "inactivate" waste product before getting sent for disposal.
- Changing the setpoints can optimize heating and cooling energy.

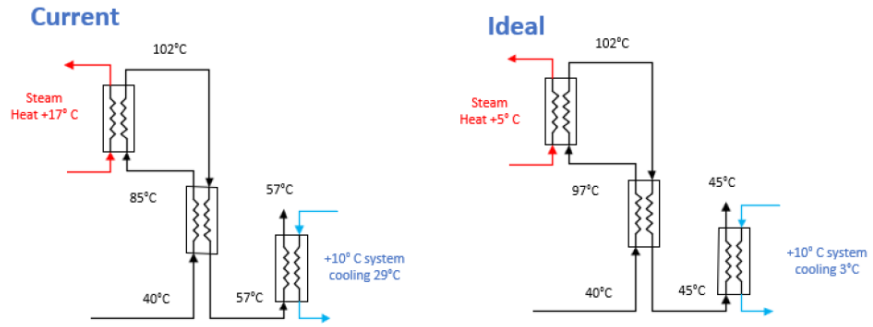
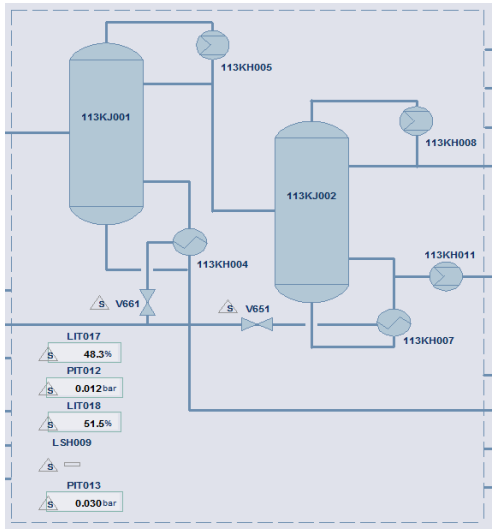


Figure 37. Temperatures before and after HX efficiency improvement (Sludge).

Distillation Optimization

- API Clayton EtOH distillation columns account for ~70% of total steam usage on site
- Improvement – The impure ethanol is combined with water upstream of the columns. The concentration being added was causing significant operating times and steam usage.
- Lowering the water concentration of the inlet stream on a *single column* had a *>1% total energy savings* on site



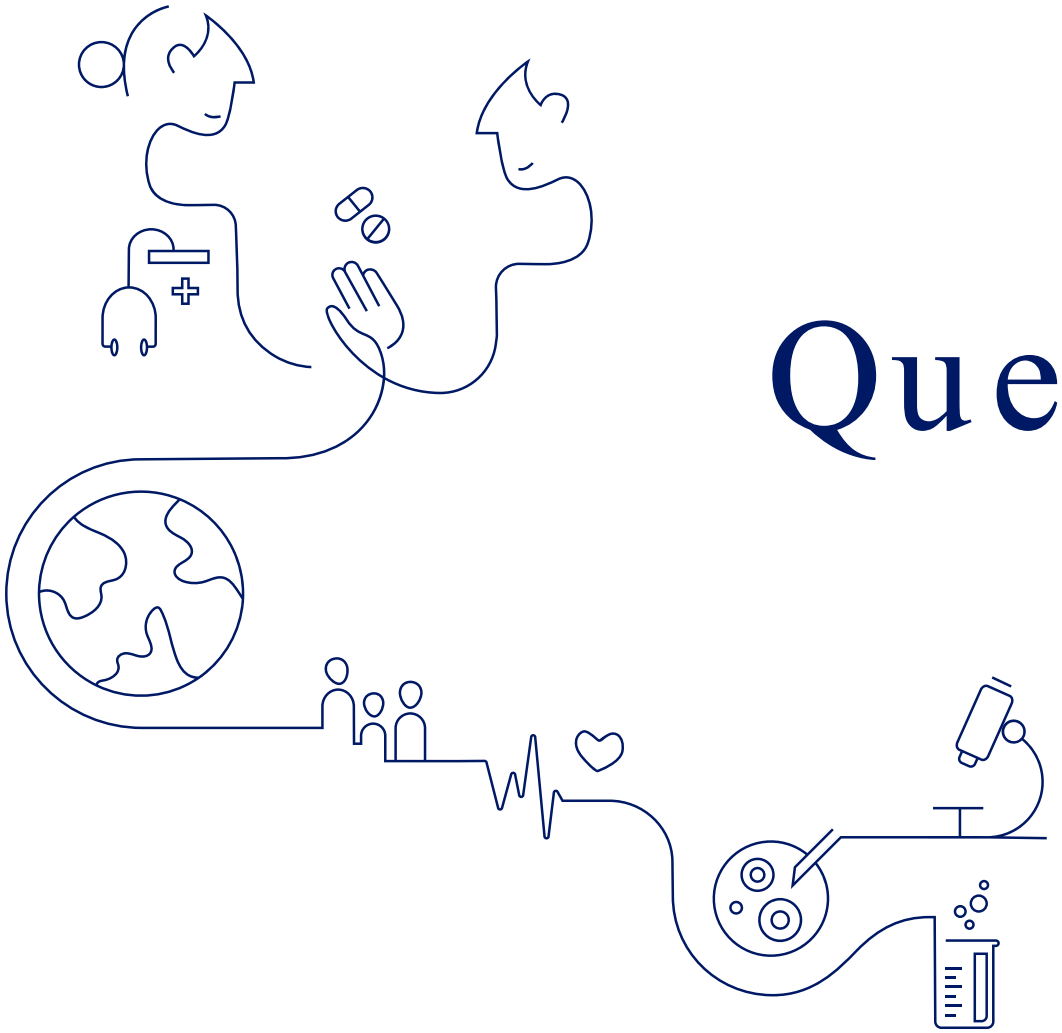
Water Savings Project Examples

Filter backwash reduction

- API Clayton has a filter step with 3 parallel filters. Each filter is flushed after a set volume.
- Process Improvement – Increase volume target per vendor recommendation to reduce total flushes for each
- Reduced almost **500k** gal water consumption reduction annually

Conductivity Setpoint Changes

- Process step with filtration which uses sodium hydroxide in one step. The changeover to water must hit a low level of conductivity before being considered 'in spec'
- Process Improvement – increase conductivity set point to reduce changeover time and volume
- Reduces over **1M** gal water per annually



Questions?

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