

SUSTAINABILITY OVERVIEW

Powering Sustainability in Pharma



ECOLAB®

Pharma Enterprise Solutions

A Century of Sustainable Solutions



For more than 100 years, Ecolab has partnered with customers to make the world cleaner, safer and healthier through innovative solutions that protect people and the resources vital to life. Our commitment to sustainability is at the core of all we do and a key driver of both customer success and our expansive positive impact on the planet. From water stewardship to climate leadership, sustainable products to powerful environmental partnerships, we strive to build a positive future.





> **"At Ecolab we see a future that is net positive—where businesses can grow both their bottom lines and their positive impact in the world."**
>
> — **CHRISTOPHE BECK,** Chairman and Chief Executive Officer

Creating 2030 Positive Impact



Ecolab operates where sustainability and economic benefits align, helping our customers do more with less.

Our plan for creating 2030 Positive Impact showcases our global team's dedication to partnering with customers to maximize business outcomes, delivering a high rate of return and positive effects on the world's water, climate, food and health.

BY 2030, WE AIM TO HELP CUSTOMERS:

Water

CONSERVE

300 billion

gallons of water annually, equivalent to the drinking water needs of **1 billion** people.

Climate

REDUCE

6 million

metric tons of greenhouse gas emissions.

Food

FEED

2 billion

people safely, preventing **11 million** foodborne illnesses.

Health

CLEAN

90 billion

hands and provide safe medical care for **116 million** people.

IN 2023, WE HELPED CUSTOMERS:

Conserve more than **226 billion** gallons of water, equivalent to the drinking water needs of **782 million** people.

Avoid more than **3.8 million** metric tons of greenhouse gas emissions.

Provide high-quality and safe food to **1.4 billion** people.

Clean **60 billion** hands, reducing the risk of **2.1 million** infections.



Climate Action: A Business Imperative

The pharmaceutical industry's role in mitigating climate change

The global climate crisis is humanity's greatest health threat of the 21st century, inextricably linked to serious and growing challenges including malnutrition, disease, injuries and displacement. On the planet's current course, considering just a few health indicators, an additional 250,000 climate-related deaths per year are expected between 2030 and 2050.[1]

The healthcare sector, including the pharmaceutical industry, produces millions of tons of waste each year and contributes between 4% and 5% of the world's greenhouse gas emissions. The supply chain accounts for as much as 71% of those emissions through the production, transport and disposal of goods and services, including pharmaceuticals and other chemicals.[2]

The pharmaceutical production process alone is estimated to produce over 220 pounds of waste for every 2.2 pounds of drug manufactured.[3] Addressing these inefficiencies is not only essential for environmental sustainability, but also for optimizing operations and business outcomes.

Breaking Down Global Emissions in Healthcare and Pharma

12%

Indirect emissions from purchased energy sources such as electricity, steam, cooling and heating.

17%

Healthcare facilities and healthcare-owned vehicles.

71%

Supply chain, including the production and transportation of pharmaceuticals.

1. Pan American Health Organization, "Climate Change and Health," https://www.paho.org/en/topics/climate-change-and-health
2. Arup & Health Care Without Harm, "Health care climate footprint report," 2019, https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint_092319.pdf
3. University of Bath, "Chemistry breakthrough leads way to more sustainable pharmaceuticals," 2021, https://www.bath.ac.uk/announcements/chemistry-breakthrough-leads-way-to-more-sustainable-pharmaceuticals

Sustainability and Growth: A Powerful Partnership

Research has shown that taking steps to improve sustainability in pharmaceutical operations is more than just an environmental exercise. It also makes good business sense—boosting efficiency and productivity while reducing energy costs. One recent study tracked emissions and financial data from a dozen of the largest pharmaceutical companies for two years and found that most were able to "bring down carbon emissions while having a substantial rise in both revenue earned and operating income."[4]

Regulatory compliance is also a motivating factor, as governments around the world push to accelerate sustainability efforts. The Paris Agreement of 2015—which united the majority of the world's nations in limiting the global temperature rise to 1.5 degrees Celsius—served as a catalyst for environmental action.

Achieving the agreement's primary goal requires reducing emissions by 45% by 2030 and reaching net-zero emissions by 2050. Those metrics are at the heart of major government-led environmental initiatives, such as The European Green Deal and the U.S. Federal Sustainability Plan. As governments continue to push toward net-zero, businesses of all kinds can expect to see more sustainability-driven regulations and reporting requirements.

4. National Library of Medicine, National Center for Biotechnology Information, "Carbovigilance: curtailing the global pharmaceutical carbon footprint," 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8651320/

See how Ecolab is making progress in our annual Growth & Impact Report.

https://www.ecolab.com/corporate-responsibility/growth-and-impact-report



SCOPE 1:

In-House Emissions

Generated on-site from combustion of fossil fuels, such as natural gas for heating or diesel fuel for generators. Emissions from company-owned vehicles are also included.

SCOPE 2:

Purchased Energy Emissions

Indirect emissions from purchased electricity, heat or steam, generated at offsite plants.

SCOPE 3:

Supply Chain Emissions

All other indirect emissions that occur in the value chain, beyond the boundaries of the company's operations.

Accelerating Sustainability Action

More pharmaceutical companies are recognizing the links between profitability and sustainability, and the greater role they can play in accelerating positive outcomes for both their companies and the planet.

The leaders of seven global biopharmaceutical companies in 2023 united with the World Health Organization (WHO) and key sector partners to call for a greener, more efficient and circular supply chain. The effort, part of the Sustainable Markets Initiative, set targets for suppliers to reduce energy and waste and commit to water efficiency and stewardship standards.

Many pharmaceutical companies are already working toward targets for reducing greenhouse gas emissions and some have committed to net-zero. Reported greenhouse gas emissions are divided into three scopes *(see left)*.

5. Open letter on supplier targets from members of the Sustainable Markets Initiative Health Systems Task Force, 2023

> "Healthcare supply chains must become greener, more efficient and circular. We must work across the value chain to decarbonise operations and do all we can to move away from fossil-fuelled heat and power."[5]

PAUL HUDSON
CEO, Sanofi

SEVERIN SCHWAN
Chairman, Roche

JOHN RIM
CEO, Samsung Biologics

EMMA WALMSLEY
CEO, GSK

BELÉN GARIJO
CEO, Merck

LARS FRUERGAARD JØRGENSEN
CEO, Novo Nordisk

PASCAL SORIOT
CEO, AstraZeneca

Your Sustainability Partner



Ecolab can help your company operate more efficiently and sustainably

Ecolab provides comprehensive and innovative solutions across the pharmaceutical value chain. We help pharmaceutical manufacturers increase operational efficiency, accelerate digital capabilities and optimize financial gains, all while striving to achieve and improve upon critical sustainability KPIs.

Our sustainability strategies help operations make progress across all emissions scopes, with solutions that range from supporting green chemistry principles to responsible material sourcing to smarter packaging that reduces waste. In manufacturing, we provide support through every step of the drug development journey. We deliver trusted experience—including more than three decades in resin development for drug formulations—unmatched expertise, innovative solutions and chemistries and valuable tools and resources.

SUPPORTING ALL AREAS OF PHARMACEUTICAL PRODUCTION

Our end-to-end enterprise approach improves operational efficiency and time-to-market.



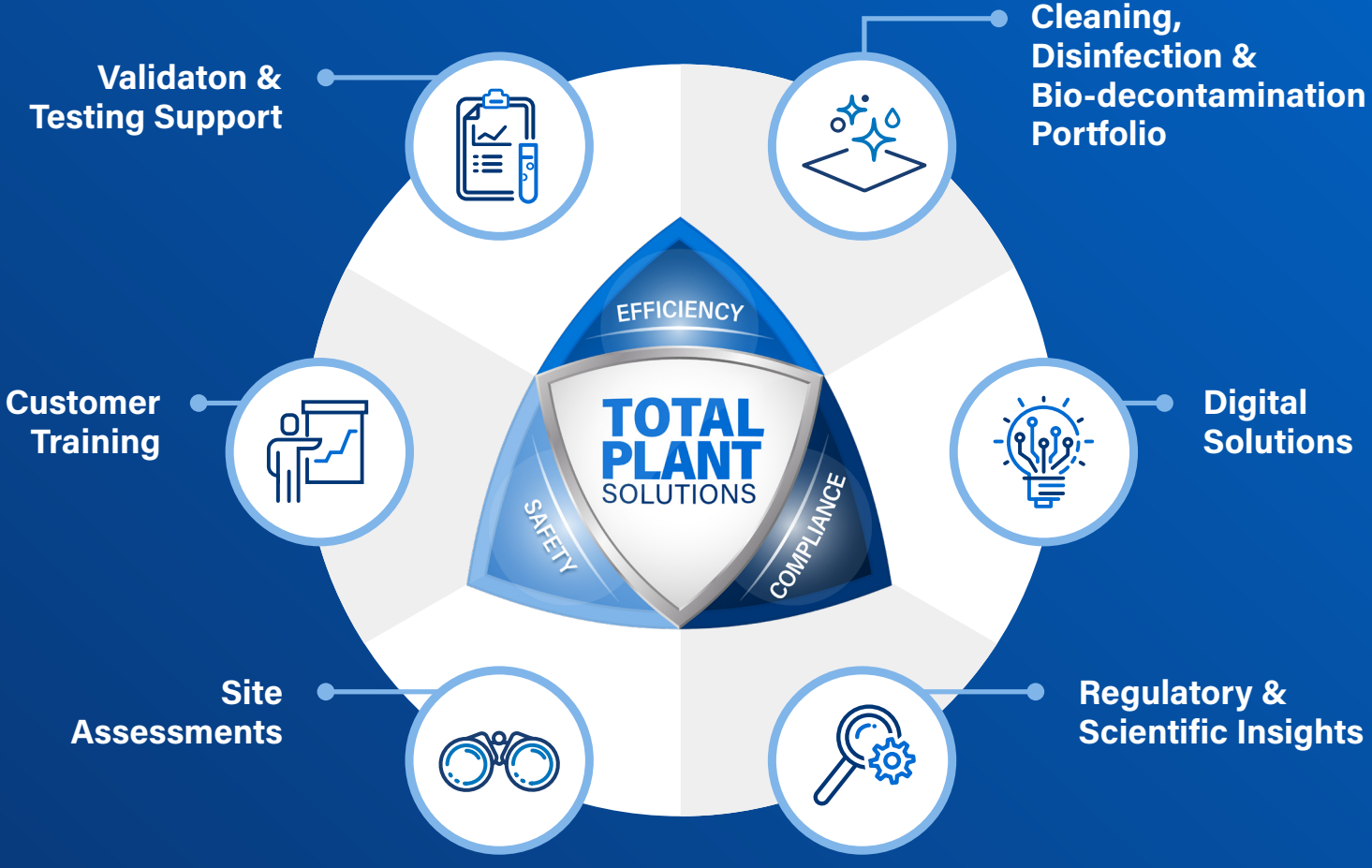
- Bio-decontamination and Bioprocessing Equipment
- Contamination Control Solutions
- Resins for Drug Purification
- Water Treatment Solutions



Driving Sustainability through Safe, Compliant, Efficient Operations

Ecolab is a leader in cleaning and disinfection in the pharmaceutical industry, with a proven track record of developing transformative, site-specific programs focused on safety, compliance, increasing total plant efficiency and ensuring quality. Our efficiency focus goes hand-in-hand with reducing energy consumption and achieving sustainability goals.

We start with understanding your process, knowledge, expertise and standards and combine that with our specialized expertise in contamination control strategies for pharmaceutical manufacturers. The result is a total plant solution that fits your specific standards and production needs.





Setting the Standard Across Operations

Responsible Packaging

Ecolab stands at the forefront of sustainable pharmaceutical packaging. Our ambitious goal is twofold:

- **100% of our packaging will be reusable[1] or readily recyclable[2]**
- **At least 35% PCR[3] will be included in all plastic packaging materials**

In 2023, responsible packaging practices in our European facilities reduced enough CO_2 emissions to save 283,374 trees and achieved more than 2 million kilograms of virgin plastic avoidance (the equivalent of 47 million 1L bottles).[4]

Renewable Electricity

In 2022, Ecolab committed to powering all of our European operations with renewable energy from the Mörknässkogen windfarm in Finland. Now at full commercial operation, it yields impressive results:

- **It generates approximately 100GWh of electricity annually** *(Enough to power 30,000 homes & avoid 20,000 tonnes of CO_2e/yr)*
- **It covers 100% of electricity used across all European sites** *(15 major offices, 26 manufacturing facilities and 7 R&D centers)*

This brings our global renewable electricity sourcing to 80%, driving toward our goal of **100% renewable electricity worldwide by 2030.**

[1] Based on packaging supplier data

[2] Mono-material, ready for recycling circle

[3] PCR = Post-Consumer Resin

[4] CO_2e factor used from eROI calculation, considered only emission from plastic production

Ecolab in Action

At an Ecolab GMP-certified manufacturing plant in South Wales, UK, our engineering team leveraged their extensive operational knowledge to enhance thermal efficiency throughout the WFI plant. This has resulted in incremental improvements to water intensity, including reduced production cycles, lowered storage tank trigger points and enhanced efficiency for WFI production.

Water
42% reduction
in water intensity

Energy
14% reduction
in energy usage

Waste
95% recycling rate
for all non-hazardous waste created on site

Learn how Ecolab has delivered results for customers like you.
https://www.ecolab.com/expertise-and-innovation/success-stories



Water Conservation

As an essential ingredient in pharmaceutical manufacturing, water plays a vital role in the industry. How water is managed can have a significant impact on a plant's productivity and bottom line. The pharmaceutical industry's approach to water also has bigger implications.

Consumers around the world hold governments and industry most responsible for water conservation, according to The Ecolab Watermark™ Study, an annual examination of the state of water stewardship based on the perception of thousands of people across 15 countries. Yet roughly two out of three respondents in every region believe businesses do not take the problem of water scarcity seriously or offer adequate solutions.

Nalco Water, an Ecolab Company, empowers operations to become better stewards of this most valuable resource, while also reducing operational costs tied to water use.

> **"Prioritizing sustainability does not have to come at the expense of growth or profitability. Rather it is a competitive advantage that supports business success and a positive impact on the environment."**
>
> **— EMILIO TENUTA,**
> Senior Vice President and Chief Sustainability Officer, Ecolab

Learn more about The Ecolab Watermark™ Study.
https://watermark.ecolab.com/

TO ENHANCE WATER EFFICIENCY OUR TEAMS:

IDENTIFY
Discover and align on sustainability and business goals.

TARGET
Perform operational assessment.

IMPLEMENT
Execute holistic solutions and best practices.

TRACK
Monitor & communicate performance outcomes.



Customized Water Management

Moving, cooling, heating and treating water across pharmaceutical facilities requires large amounts of energy. Our programs and expertise can help reduce water use, energy consumption and emissions.



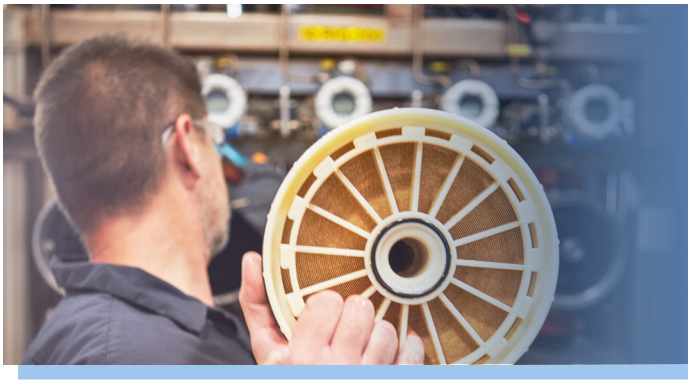
REDUCE

Monitor and improve efficiency of cooling systems, boiler and dryer systems and membrane systems.



REUSE

Use process water as a source for other systems where applicable.



RECYCLE

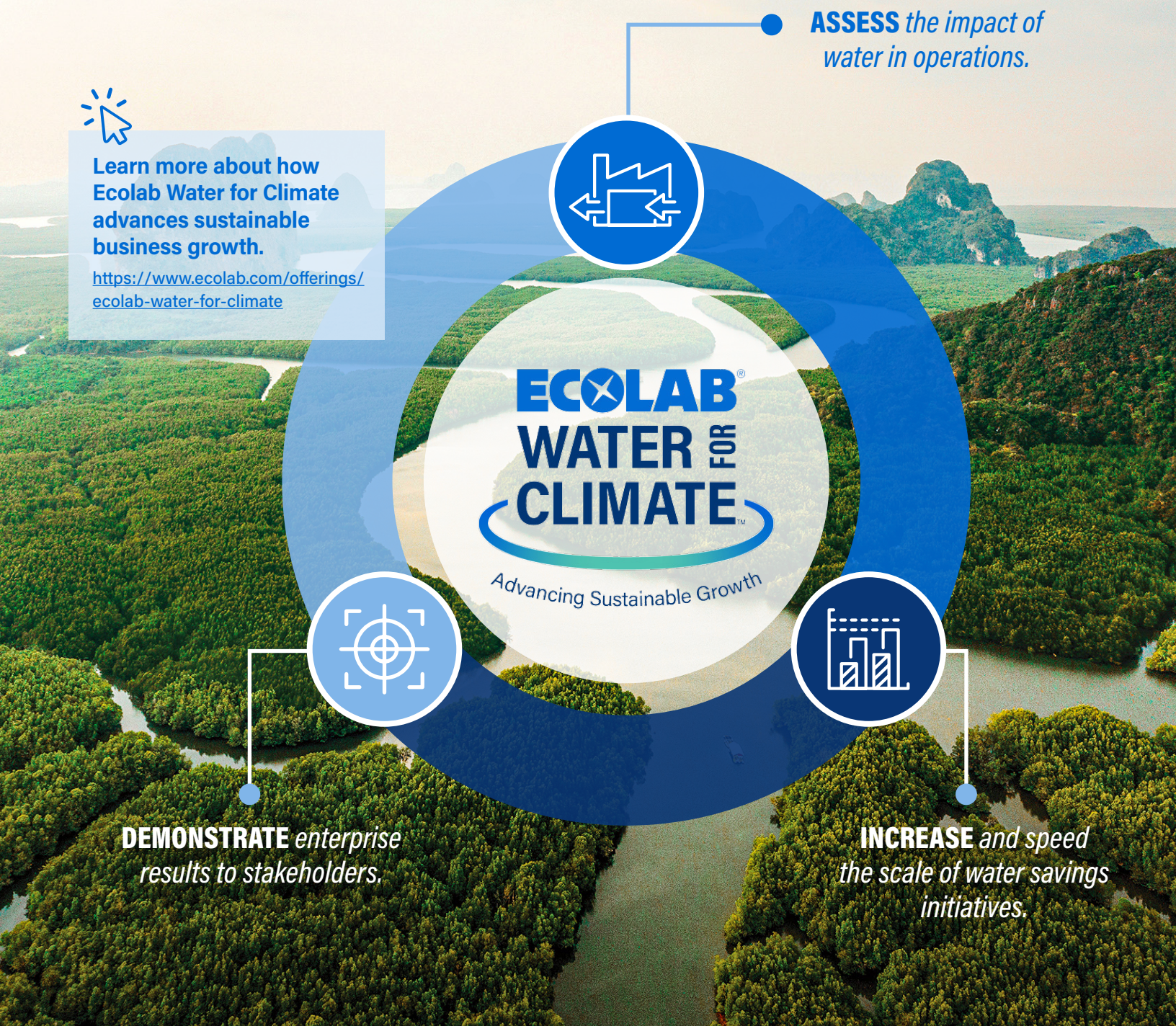
Reduce freshwater consumption by repurposing wastewater.

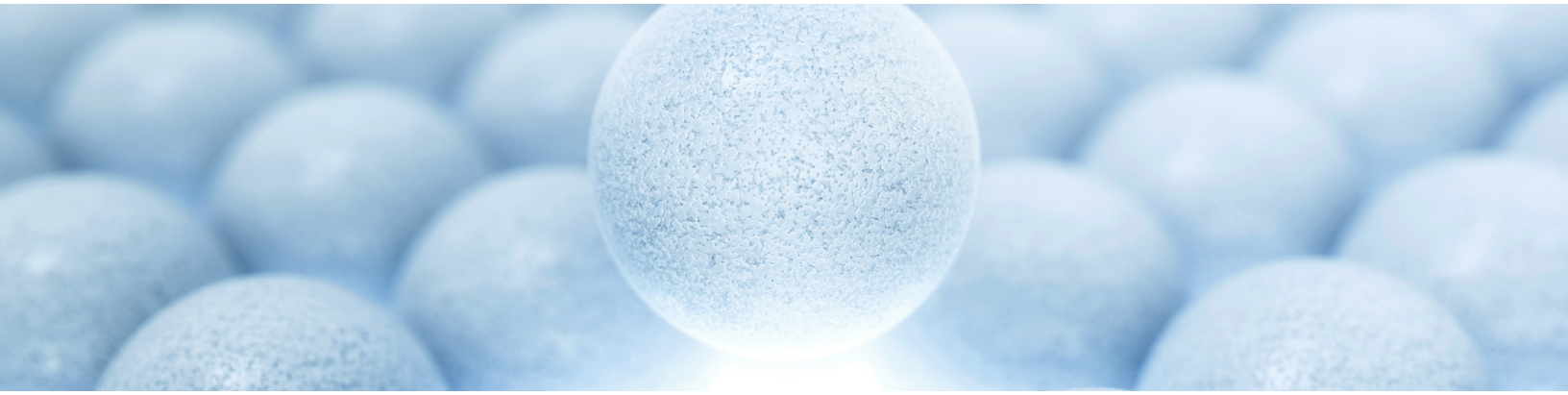
Water for Climate™

By reducing water usage, companies can lower energy consumption and greenhouse gas emissions while simultaneously lowering operating costs. The Ecolab Water for Climate program is designed to help companies accelerate progress toward climate goals by reducing water use across the enterprise while closely tracking and quantifying its impact.

Through Water for Climate, our teams and technologies can also help optimize clean-in-place (CIP) processes and support the removal of per- and polyfluoroalkyl substances (PFAS) and active pharmaceutical ingredients (APIs). We utilize digital, chemical, consulting and engineering solutions to push what's possible with water.

Learn more about how Ecolab Water for Climate advances sustainable business growth.
https://www.ecolab.com/offerings/ecolab-water-for-climate



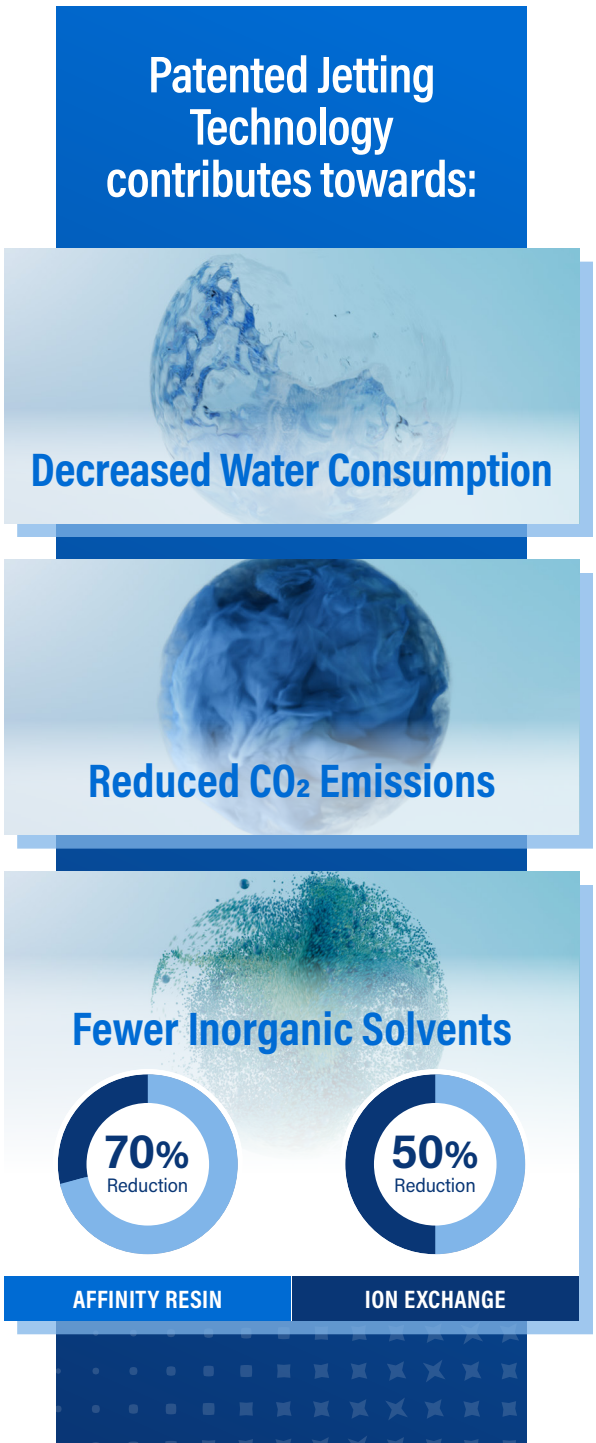


Driving Innovation Through Sustainable Resin Technology

Ecolab is a leading manufacturer of healthcare and life science products, specializing in ion exchange, catalysts, adsorbents and specialty resins for drug manufacturing and other pharmaceutical applications. With a global production network, we ensure supply security and quick market access.

Our resins meet the standards of the American (USP), European (Ph.Eur.), British (BP) and Japanese (JP) pharmacopeias. They serve as active pharmaceutical ingredients, extract and purify enzymes and remove contaminants such as PFAS (Per- and polyfluoroalkyl substances), organic solvents and heavy metals from wastewater to meet industry discharge regulations.[1] [2]

Ecolab's ion exchange resin technology also supports efficient and cost-effective CO_2 capture in both Direct Air Capture (DAC) and Point Source Capture (PSC) applications. Our patented Jetting technology offers a sustainable approach to producing bioprocessing resins compared to traditional processes.



1. US EPA (2019). NPDES Permit Basics | US EPA. [online] US EPA. Available at: https://www.epa.gov/npdes/npdes-permit-basics.

2. European Commission (2000). Water Framework Directive. [online] environment.ec.europa.eu. Available at: https://environment.ec.europa.eu/topics/water/water-framework-directive_en.

Learn more about Ecolab's resin technology.

https://www.purolite.com



A Sustainable Approach to Pest Prevention

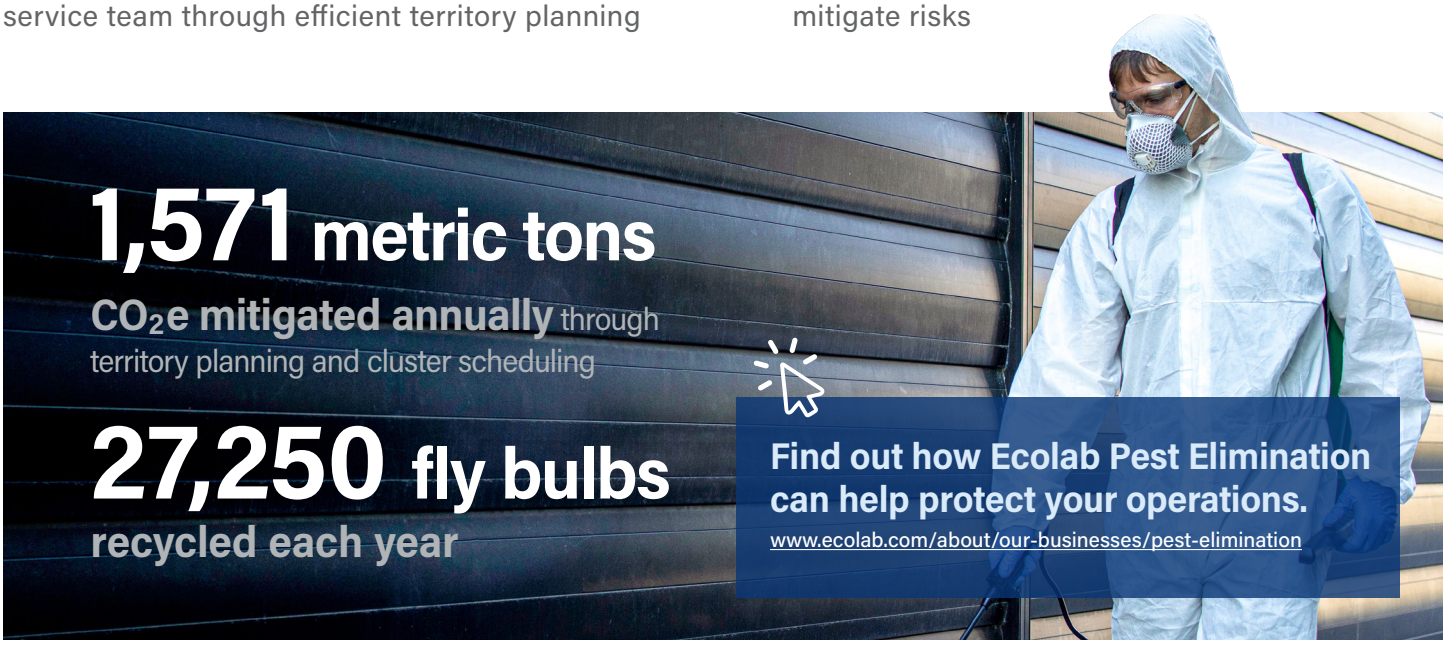
Using leading technology and innovation, Ecolab Pest Elimination is committed to delivering effective pest prevention solutions while minimizing environmental impact.

As part of Contamination Control Strategies, we take a holistic approach to pest prevention. Our Integrated Pest Management focuses on identification and preventive measures first, prioritizing non-chemical methods. We perform a rigorous assessment of each product for its efficacy, efficiency and environmental profile before adoption. Treatments are recorded and fully auditable to track the use of any necessary pesticides.

We minimize the greenhouse gas emissions of our service team through efficient territory planning and cluster scheduling. And we reduce solid waste by using recyclable materials in our products.

We forge partnerships that empower pharmaceutical companies to win the fight against pests and maintain safe, compliant, healthy operations through:

- Customizable pest management plans
- A scientific, outside-in approach to building protective barriers inside and out
- Innovative, science-based solutions
- Insights delivered by your Ecolab Service Specialists
- Experts who can identify pests and mitigate risks



Expertise and Innovation



Science-backed solutions from a global team of industry-leading experts

Regardless of where your company is on its sustainable journey—whether you are actively working toward targets or aren't sure where to start—Ecolab has the people and resources to help. The depth of our technical expertise combined with our innovative spirit and comprehensive, collaborative approach makes us your one partner you can count on. If you are looking for consulting or are ready to implement a best-in-class program across your enterprise, you can expect the same high level of services from our teams.

Our Total Plant Assessments provide a powerful first step for any operation, delivering water management and optimization, contamination control strategies and other critical insights. An assessment will help you create a blueprint for improving operational efficiency, saving resources and simultaneously achieving production and sustainability goals. Our local implementation teams can then apply what's working in one plant to other facilities, accelerating progress company-wide.

When you partner with Ecolab, you partner with a global team of scientists, engineers and technical specialists dedicated to helping your pharmaceutical company as part of their commitment to solving the world's most pressing challenges.

Learn more about our team's innovative approach to problem solving.
https://www.ecolab.com/expertise-and-innovation

1,200
R&D scientists, engineers and technical specialists

13,900
Cumulative years of innovating experience

11,200
Patents

20
Global research centers



Accelerating Efficiency through Digital Innovation

Ecolab's digital technology innovations are transforming the way pharmaceutical companies are doing business. Predictive analytics, remote service, real-time data and other solutions are delivering better knowledge of operations, accelerated growth and more efficient use of critical resources.

ECOLAB3D™

Turning real-time insights into actionable outcomes is essential for maximizing operational efficiency. The ECOLAB3D IIoT cloud-based digital platform is at the heart of our digital offerings, collecting data from Ecolab's process control and monitoring systems, automation tools and other systems to create real-time alerts, optimize plant operations and benchmark performance.

Learn more about our Ecolab3D IIoT Platform.

https://www.ecolab.com/nalco-water/expertise-and-innovation/ecolab3d-iiot-platform

ECOLAB3D-powered Solutions

Examples of ECOLAB3D technologies improving pharmaceutical operations around the world:

3D TRASAR™

An advanced water monitoring system, 3D TRASAR technology helps our customers save more than 215 billion gallons of water per year in utility and process applications.

Water Flow Intelligence

Aligned with a corporate water-reduction strategy, Water Flow Intelligence unlocks opportunities for significant water savings and return on investment.

Water Quality Intelligence

Combines controller data, field data, laboratory data and customer-defined KPIs and analysis to deliver updates in real time and take a more proactive approach to problems.

Other Innovations Accelerating Productivity in Pharma

CLEEN by Ecolab is an end-to-end compliance platform that empowers pharmaceutical companies to identify and address manufacturing inefficiencies and compliance risks.

Smart Labels digitize product information, reducing the risk of human error and preserving data integrity.

Sustainability Successes

Examples of how Ecolab helped pharmaceutical customers boost efficiency and reduce their environmental impact.



Quantified Results, Exponential Value

eROI℠ by Ecolab

Ecolab empowers customers by delivering powerful results quantified by eROI, or exponential return on investment. eROI demonstrates how our solutions, insights and expertise help customers achieve business and environmental goals and drive value across their organizations. Here's a look at some real examples of our total value delivered.



= TOTAL VALUE DELIVERED

Find out more about how we deliver exponential value for customers.

https://www.ecolab.com/expertise-and-innovation/exponential-value-eroi



Insight

As part of an effort to ensure product safety and maximize its long-term impact on improving global health, a pharmaceutical company pledged to reduce its environmental impact by 25% by 2030.

Innovation

Ecolab partnered with the company to maintain safe operations while reducing water and energy use. Ecolab's 3D TRASAR™ technology was implemented to monitor and minimize water use, while maximizing efficiency and productivity.

eROI℠ by Ecolab

Annual Savings

Water
98 million gallons
(370,970 m^3)

Energy
273 million kWh

Greenhouse Gases
19,000 metric tons
of CO_2e

Waste
44 pounds
of packaging waste

Total Value Delivered
$1.5M



Insight

A global pharmaceutical company faced up to 10 days of production downtime every time the stainless steel filters on its dryers failed. In some cases, batches would be lost. The alcohol-based filter cleaning process was not effective and replacements were costly.

Innovation

After consultation, process review and testing, Ecolab identified COSA PUR 81 as a specialized cleaning agent that could reduce lost productivity and product, while making the cleaning process more efficient.

eROI℠ by Ecolab

Annual Savings

Assets
$76,215
saved in filter replacement costs

Waste
$101,615
saved in lost product costs

Profitability
$25,405
saved in lost labor costs

Productivity
$10,160
saved in cleaning time

Total Value Delivered
$213,410



Insight

As part of a company-wide initiative to improve energy efficiency and reduce greenhouse gas emissions, a pharmaceutical manufacturer partnered with Ecolab to conduct a large-scale survey of cooling systems at its plant. Multiple issues were discovered including microbiological fouling, uncontrolled water loss and severe corrosion.

Innovation

Ecolab helped the customer implement 3D TRASAR™ Technology for Cooling Water with a customized cooling water treatment program. New chemistry and automated, real-time monitoring helped to control scale, corrosion and microbiological stresses.

eROI℠ by Ecolab

Annual Savings

Water
645,595 gallons
(2,455 m^3)

Energy
261,833 kWh

Greenhouse Gases
129.6 metric tons
of CO_2e

Human Safety
Reduced Legionella risk and exposure for employees

Total Value Delivered
$44,931

Your Sustainability Leader

Forbes 2023 BEST EMPLOYERS FOR DIVERSITY
POWERED BY STATISTA

2024 WORLD'S MOST ETHICAL COMPANIES® ETHISPHERE 18-TIME HONOREE

HUMAN RIGHTS CAMPAIGN FOUNDATION 2023 2024 EQUALITY 100 Leader in LGBTQ+ Workplace Inclusion

CDP DISCLOSURE INSIGHT ACTION

NETS® Network of Employers for Traffic Safety

GOLD | Top 5% ecovadis Sustainability Rating JAN 2024

Bloomberg Gender-Equality Index 2023

Member of Dow Jones Sustainability Indices Powered by the S&P Global CSA

AMERICA'S MOST JUST COMPANIES CNBC 2024
JUST BUSINESS IS BETTER BUSINESS
Proud to be a JUST 100 leader

FTSE4Good

SellingPower 50 BEST COMPANIES TO SELL FOR 2023

DEI BEST PLACE TO WORK FOR DISABILITY INCLUSION 2023℠
100 DISABILITY EQUALITY INDEX

MSCI AAA

DiversityInc TOP 50 2023

Learn more about Ecolab's awards and recognition.
https://www.ecolab.com/media-center/awards-and-recognition



Contact your Ecolab sales representative to learn more about how we can help you increase efficiency while reducing water, energy, greenhouse gas emissions and more.

The results in the case studies included in this document are specific to the individual customers and may vary for other customers based on factors and circumstances in their operations.

ECOLAB®

Global Headquarters
1 Ecolab Place, St. Paul, MN 55102
www.ecolab.com | 1800 2 ECOLAB
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