

A photograph of a rustic wooden log bridge crossing a stream in a lush green forest. The bridge is made of many parallel logs and spans across the water. The surrounding area is filled with vibrant green foliage and trees, creating a serene natural setting. The water flows gently through the stream, and the overall atmosphere is peaceful and sustainable.

**SUSTAINABILITY IN THE MARKETPLACE:
DISTINGUISHING YOUR COMPANY BY DOING
GOOD**

Nathan Melvin

Quality, Environment & Safety Specialist – Novozymes Biologicals, Inc

OUR VISION



“We imagine a future where our biological solutions create the necessary balance between better business, cleaner environment and better lives.”

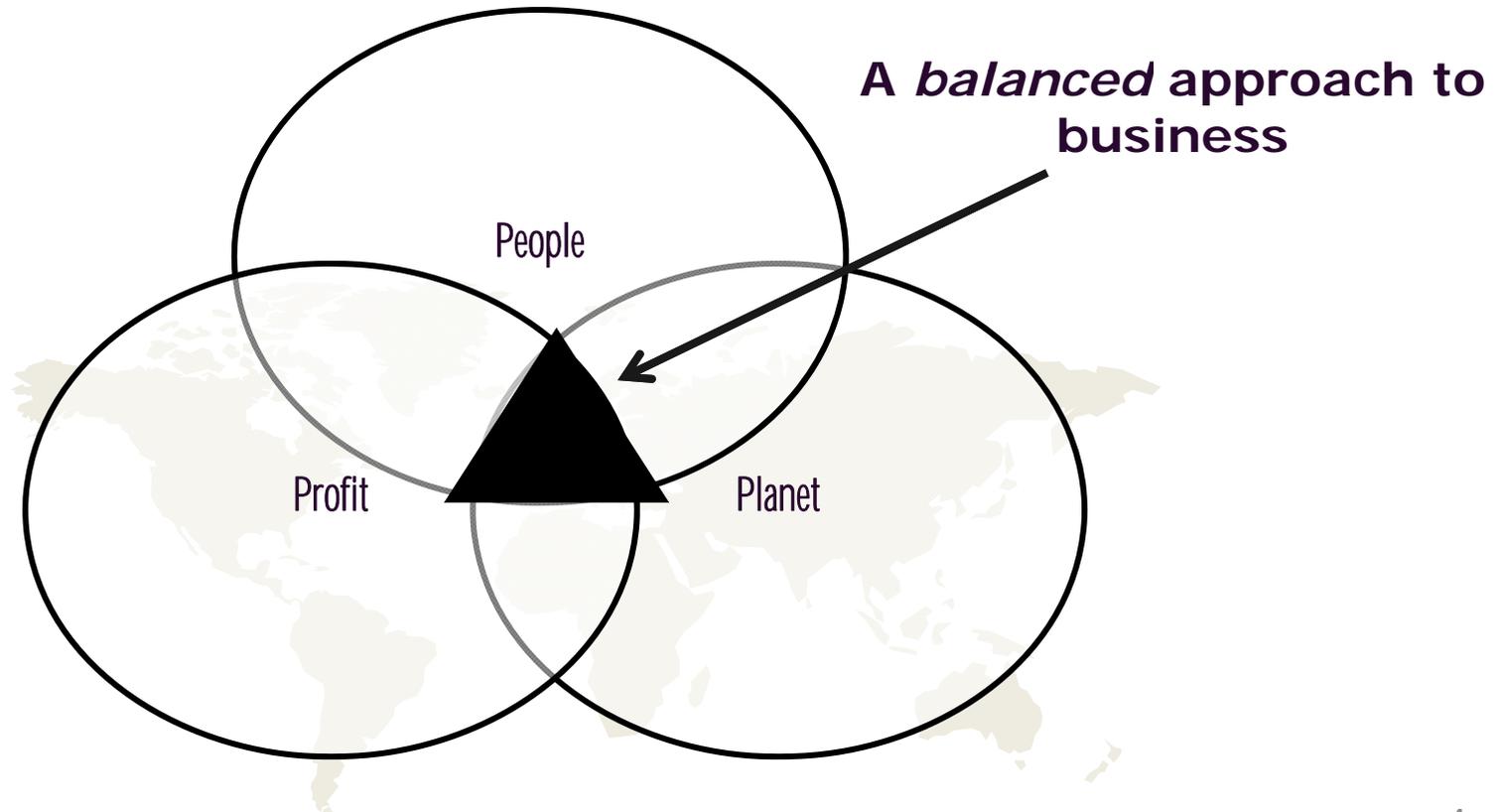
Our values



Sustainability - a definition...

To be "sustainable" means to meet the needs of the present without compromising the needs of future generations to meet theirs

(UN, 1987)



Recognized as a sustainability-driven organization

Novozymes in the Dow Jones Sustainability Indexes (DJSI):

- Included in DJSI Biotechnology sector since 2000, and sector leader 2000-2007 and 2009-2012
- 'Gold Class' rating in 2010-2013 in Sustainable Asset Management (SAM) Sustainability Yearbook



Founding member of the Sustainability Consortium



Top 1% of Environmental Investment Organization carbon reporting



Best in Class Storebrand SRI



Ranked Global 100 – listing the world's most sustainable corporations



Member of FTSE4Good Global and Europe



Member of SB20 by SustainableBusiness.com

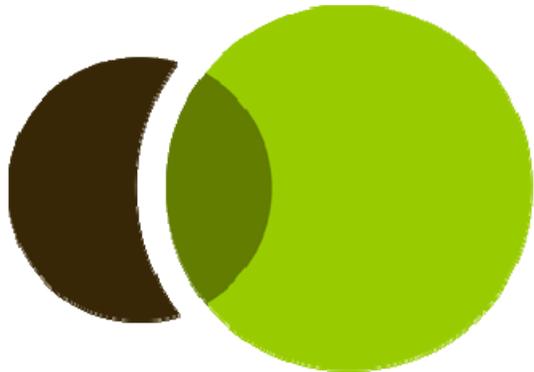


PRIME status by oekom research



5 in Carbon Disclosure Project annual Nordic Leadership Index

NOVOZYMES STRIVES FOR SUSTAINABILITY



ROBECOSAM
Sustainability Award
Gold Class 2013

NOVOZYMES IN THE DOW JONES SUSTAINABILITY INDEXES (DJSI):

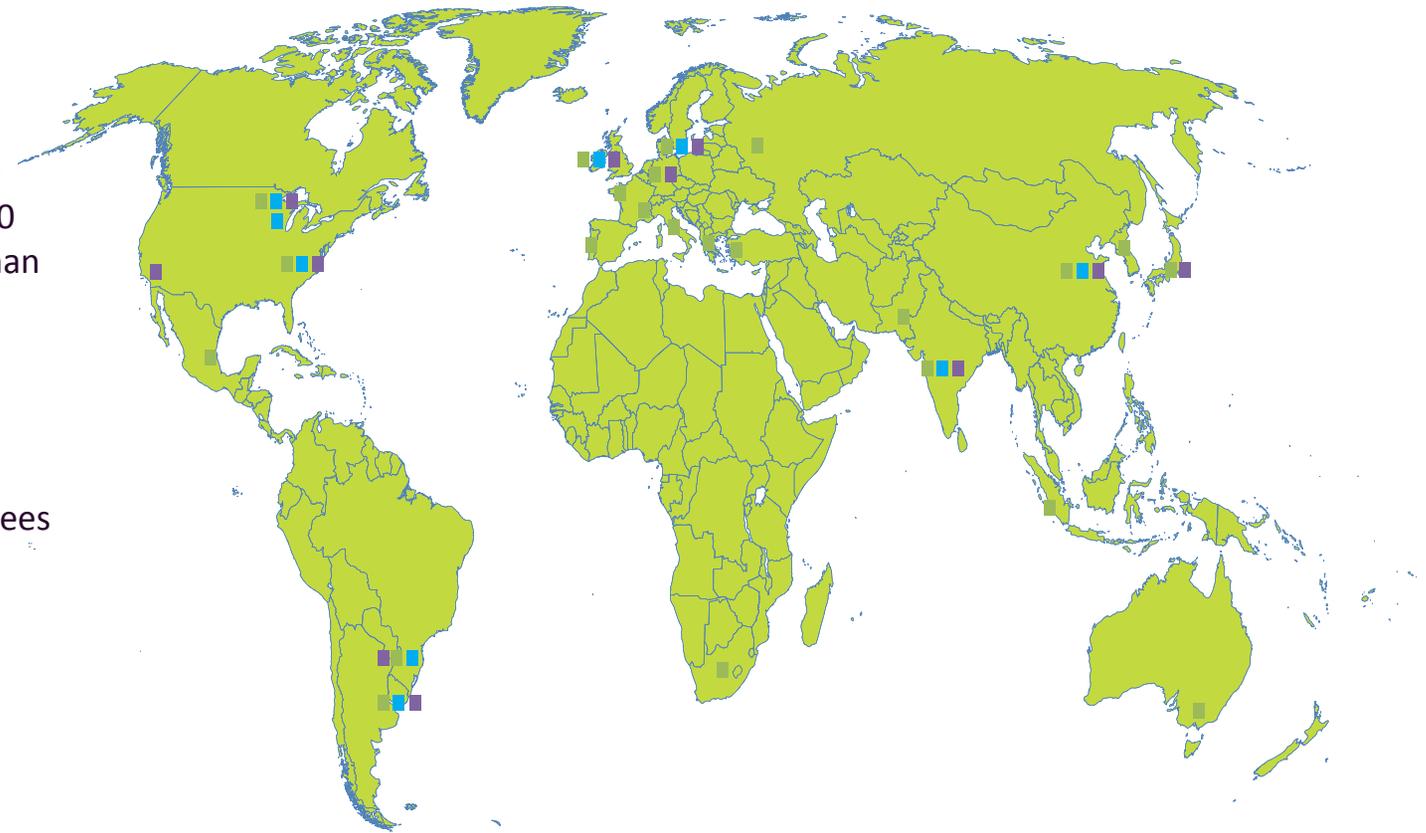
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We are close to customers around the world

Customers use our more than 700 products in 130 countries within more than 30 different industries

We are global leader in industrial enzymes & microorganisms

and have +6,000 employees worldwide



■ SALES OFFICES

■ PRODUCTION

■ RESEARCH

We rethink everyday products everyday



NATURE INSPIRES INNOVATION AT NOVOZYMES



We find the
microorganisms
in nature



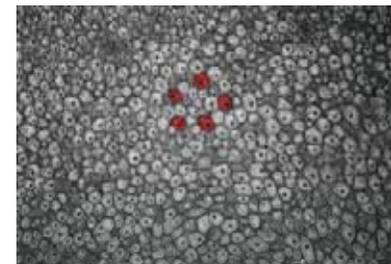
We grow them in big
fermenters. From one
microorganism
to trillions in only 24
hours



Enzymes



Microorganisms



Other proteins



Innovations that benefit customers in many ways

Cost reduction

Our biological solutions almost always saves energy, water and chemicals. Thus reducing cost for our customers



New products

Our R&D capacity enables customers to bring new and better products to the market some times changing their industry



Sustainability

Based on our products and insight we help customers improve their environmental profile and reach their CSR-targets



How Novozymes exercises sustainability in practice

What we do!

Our products

We help our customers produce more with less

We demonstrate responsible business practices

Our conduct

How we do it!



Bioinnovation Can Decouple Economic Growth From Use of Natural Resources

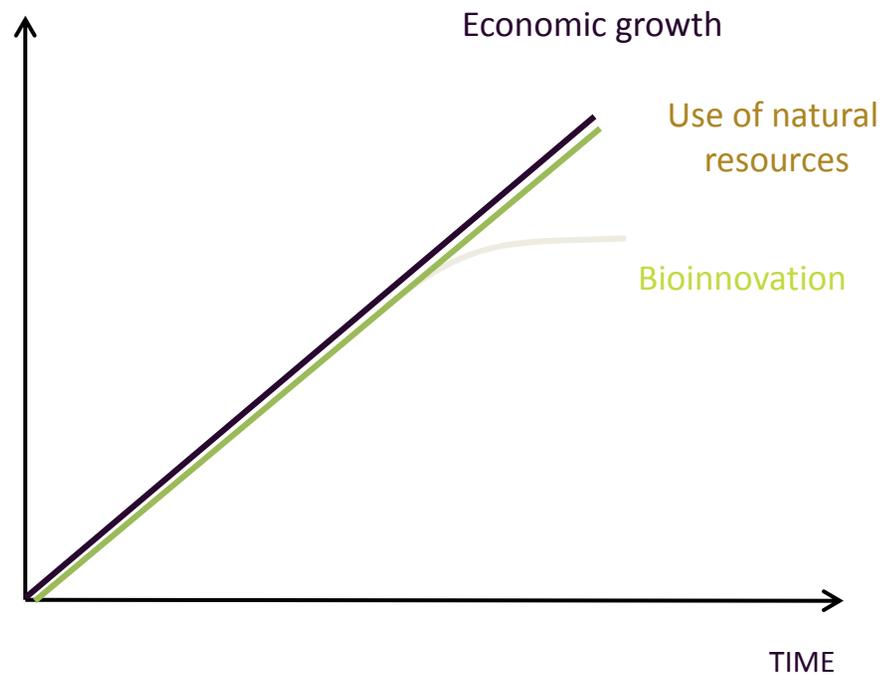
By 2050 we will be 9 billion people!

- Produce “more with less”
- Increase efficiency and yield
- Decrease energy consumption
- Reduce waste stream

Examples:

- Wash at low temperature
- Replace chemicals in detergent
- Replace phosphate in feed
- Replace malt in brewing
- Reduce fertilizer load
- Reduce waste of food

...



BioBusiness' business areas



Biologicals

Beneficial microorganisms for:

- Cleaning Solutions (CS)
- Wastewater Solutions (WS)
- Aquaculture



Biopharma

Biopharmaceutical ingredients & technologies for:

- Medical devices
- Drug delivery and formulation



BioAg

Microbial technology for:

- Biofertility
- Biopesticides
- Bioyield enhancements

Bioenergy is reducing dependence on oil

By using advanced biofuel made from biomass and other organic waste you can help significantly reduce CO₂ emissions.

What's in it for the ...

- Industry**  Oil independence
Stable prices
- World**  CO₂ neutral energy
- Consumers**  New and cleaner products



Enzymes for detergents conserve energy

With modern detergents you can wash your laundry at low temperature without compromising the quality, save energy and use less harsh chemicals.

What's in it for the ...

- Industry**  Stable prices
New claims and products
- World**  Less CO₂ emission and a cleaner water environment
- Consumers**  New, cleaner and more sustainable products



Microorganisms grow sustainable, higher-yield crops

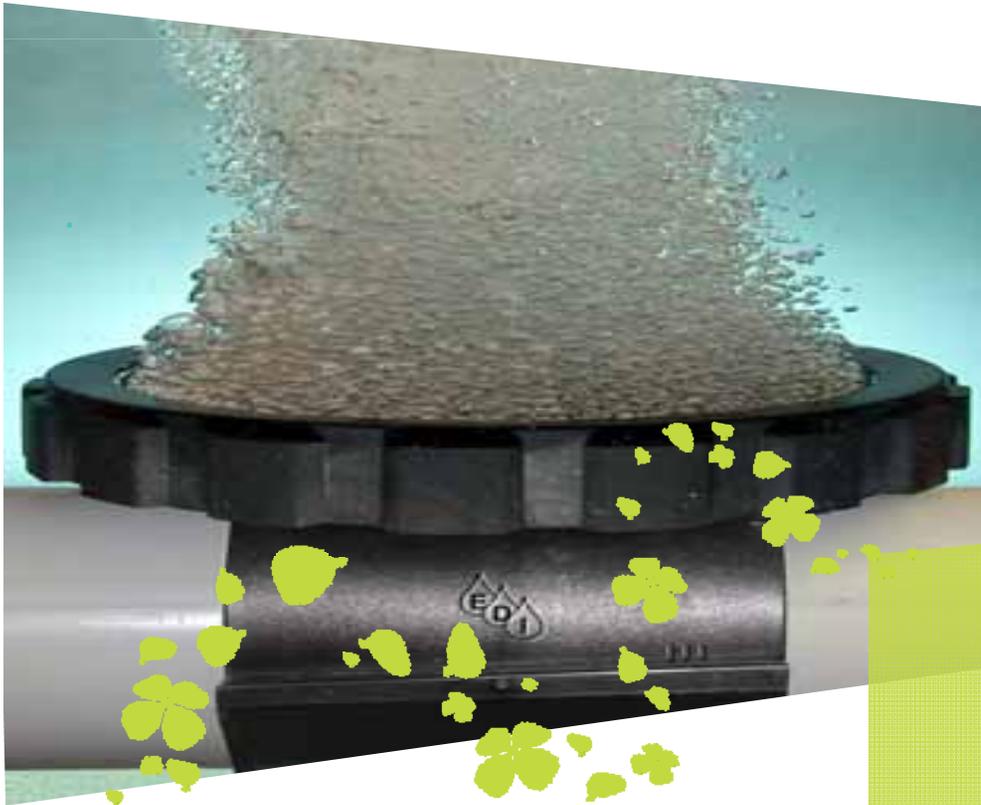
With a unique blend of microorganisms farmers can improve the efficiency of essential nutrients for plant growth and get higher yields

What's in it for the ...

- Industry**
 A sustainable solution
Reduced cost
Higher yields
- World**
 Cleaner water environment
More food/acre
Efficient and sustainable use of resources
- Consumers**
 Improved food supply



General cleaning with less chemicals



Novo MAC with BioS Multi-Action
Microbial Consortium



In the old days...

... general cleaning required chemicals, which ended up in waste water, harming our environment.



With bioinnovation...

... you can get multipurpose cleaning, long-term odor control, free-flowing drains, and improved septic system performance.

This reduces the amount of chemicals drained into the environment and helps keep our planet clean.

Recycling paper without using chemicals



In the old days...

... lots of chemicals were used to bleach waste paper to remove the ink so that it could be recycled.

This process required a lot of water and expelled a lot of chemicals into the environment.



With bioinnovation...

... you can use a natural product to lower residual dirt and save on bleach chemicals.

Enzymes also ensure that less water is used in this process.

Aquazym[®], Novozym[®] 342

Degrading waste the right way



Bi-Chem® Compost Plus,
Bi-Chem Manure Degradator



In the old days...

... compost heaps just sat around for years before they could be used as fertilizer.

Agricultural waste smelled bad and had no use beyond being used as a fertilizer.



With bioinnovation...

... the natural compost degradation cycle can be accelerated.

In farms, manure can be liquefied and then be used as fuel and microbes can be used to control odor problems.

Degrading waste the right way



PondPlus®, PondProtect®



In the old days...

... antibiotics and chemicals were not much help to combat viral attacks, oxygen depletion, and toxicity.

These problems resulted in smaller prawn yields and smaller prawns in general.

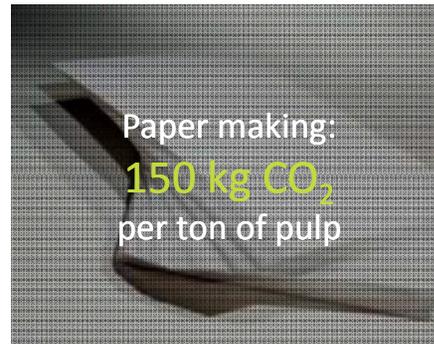
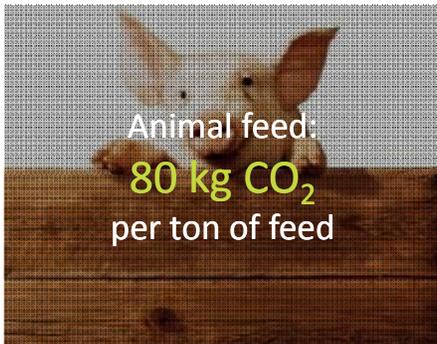


With bioinnovation...

... organic waste found in prawn ponds can be degraded easily.

Microorganisms significantly improve pond water quality and ensure good algal balance and pond color, reduction in stress, and improved prawn yields.

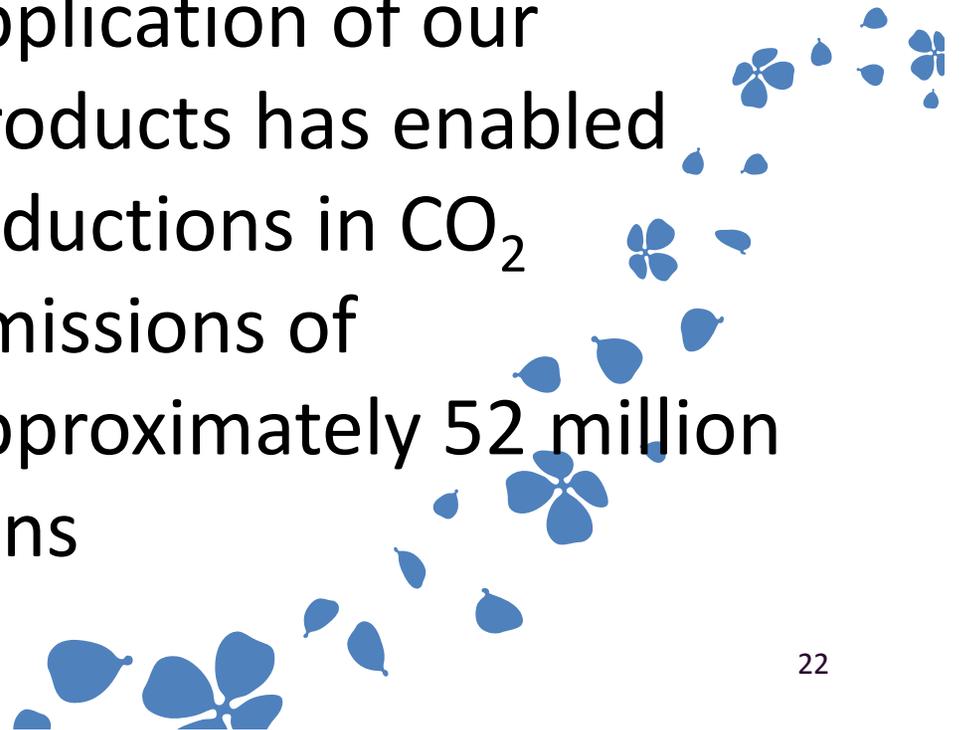
Today, our products are helping to reduce CO₂ in many industry



Tons of CO₂ emissions avoided



- In 2013 worldwide application of our products has enabled reductions in CO₂ emissions of approximately 52 million tons



Lifecycle assessment (LCA)
Environmental assessment from “cradle to grave”



Raw material production



Enzyme production

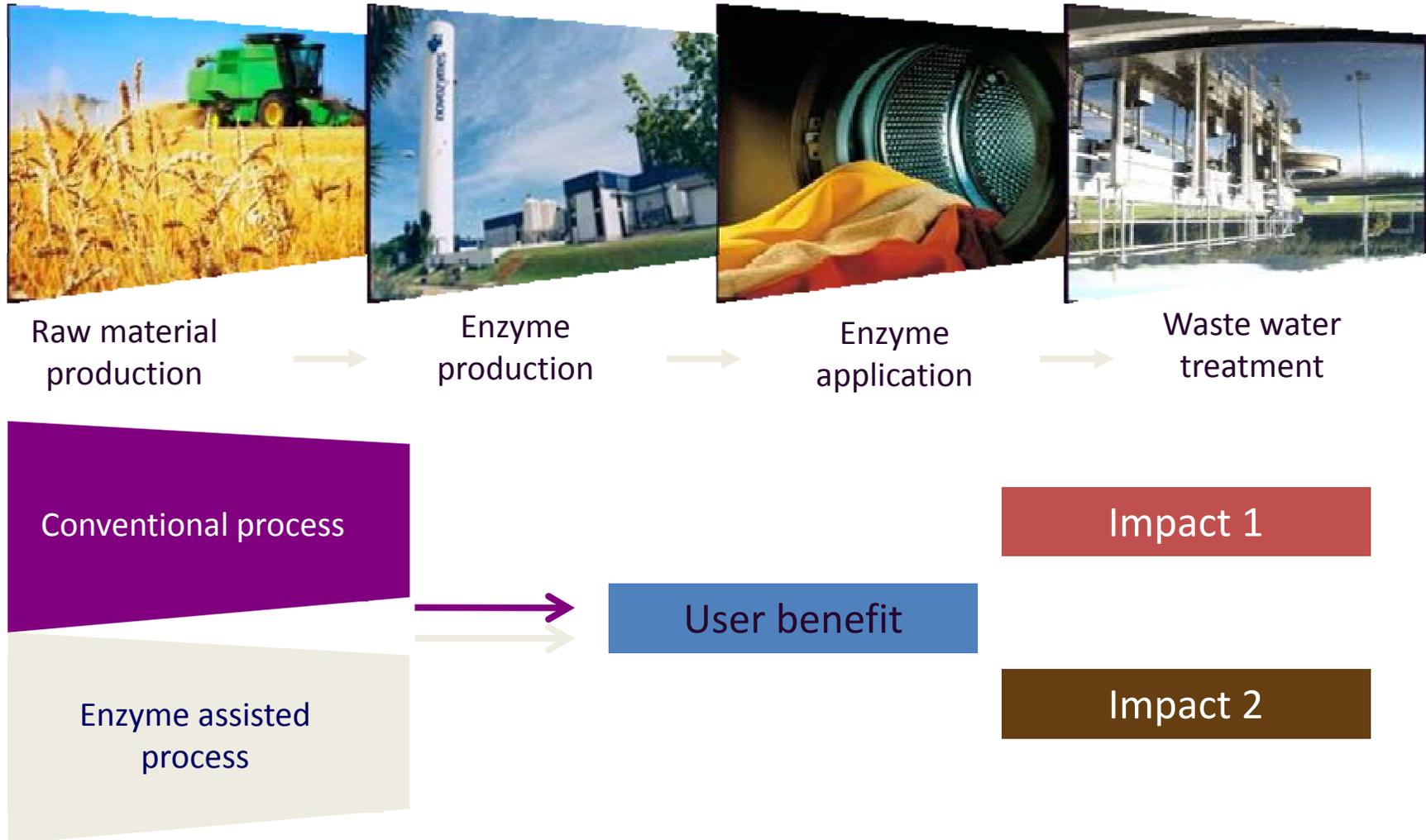


Enzyme use



Waste water treatment

Documenting the environmental impact of our products – Life Cycle Assessment (LCA)



Quality control of Novozymes' LCA studies

LCA studies used in Novozymes' external communication are

- Carried out in accordance with the requirements of the ISO 14040 standard on LCA
- Subject to external critical review and/or
- Published in the International Journal of life cycle assessment



International
Organization for
Standardization

THE INTERNATIONAL JOURNAL OF
LIFE CYCLE ASSESSMENT

Salem's contribution to Resource Conservation in Production

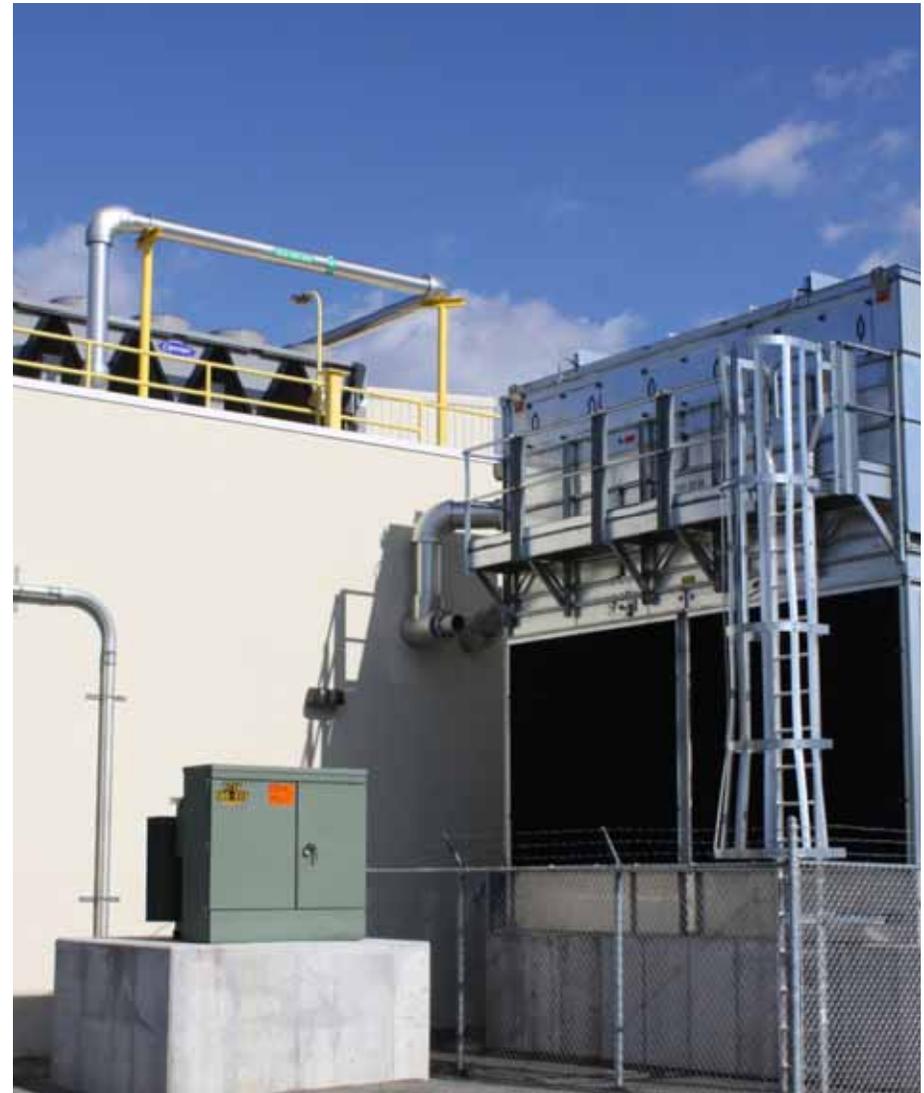
Corporate Global Targets

- Improve energy efficiency by 50% in 2015 compared to 2005 (40%)
- Improve CO2 efficiency by 50% in 2015 compared to 2005 (54%)
- Improve water efficiency by 40% in 2015 compared to 2005 (33%)
- Enable a 75 million ton reduction in CO2 emissions in 2015 through our customers' application of our products (52 M)

Year	GJ (Energy)	Water (gal)	CO2 (tons)
2009 (baseline)	6,447	1,931,282	621
2013 (end of year)	4,256	830,452	491
Goal (% Reduction)	20%	16%	20%
Actual (% Reduction)	34%	57%	21%

1 VVM/Chiller Project

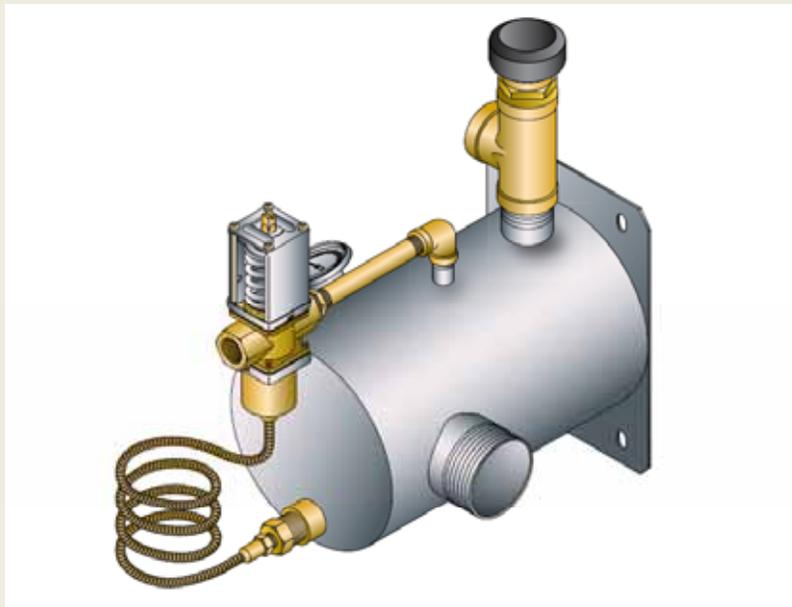
- Installed larger air compressor and chiller to supply 1 VVM to fermenters and improve cooling capacity
- Stopped the need for once pass cooling
- Approximate savings of **3,000,000 gallons per year**



Water-Mizer

Autoclave Modification

- Automated valve for cooling water to reduce usage
- Approximate savings of **900,000 gallons per year**



Boiler Burner Replacement

- Upgraded burners on two of the highest used boilers
- Made more efficient by 10%
- Approximate savings of **66,000 GJ per year**
- ~\$43,000 per year
- ~3,680 tons of CO2 reduction per year



Lighting Upgrade

Lighting Project

- Approximate savings of **495,000 kWh** per year
- Instant ON
- Less bulb heat



Cold Storage Door Replacement

- Approximate savings of **10,000 kWh** per year



Other Energy Projects

Solar Collector for Hot Water

- Approximate savings of **5000 kWh** per year
- Approximate savings of **550 m3** per year

Data logging at CRT

- Analysis shows wind power not feasible <4mph avg



New Technologies

- Utilizing Ultrasound and Infrared Technologies to conduct steam and air leak surveys with our sister plant in Franklinton
- Air/Steam Leaks = **\$31,258.00** USD per year



Waste Reduction

- Reduced waste disposals by 51%
- Recycled over 20 tons of material with new bailers



The Green Team

- 11 Members Strong
- Cross functional group:
 - Facilities, Process Engineering, Supply Chain, Production, R/D, QES
- What we do!
 - Within the Company
 - Implement projects and other green initiatives to reduce resource consumption of water and energy
 - Improve recycling rates and decrease waste output
 - Lead Teambuilding events
 - Within the Community
 - Lead efforts to promote good corporate stewardship



THE POTENTIAL IS HUGE



**Let's Rethink Tomorrow
and change the world together**

