



Berkeley Sustainability Berkeley Lab - CAG



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Sustainability

Vision and Strategic Intent

Ensure Sustainability and drive long-term commercial success through developing, commercializing, and distributing innovative products and services, conserving resources, reducing waste, enhancing ecological performance, effectively managing knowledge, and fulfilling related social responsibilities.

“Health for all, hunger for none” – with our strategic focus on sustainability, we are making a key contribution to ensuring our vision becomes reality. We believe that economic growth and sustainability should go hand in hand. Sustainability is therefore a core element of our corporate strategy and enjoys the same status among our corporate goals as our financial indicators.

Bayer has aligned our sustainability targets to the United Nations’ Sustainable Development Goals (SDGs). As a major player in the areas of health and nutrition, we have an influence on many of the 17 SDGs and can have the greatest impact on the following items: **#1 No Poverty, #2 Zero Hunger, #3 Good Health and Well-being, #5 Gender Equality, #6 Clean Water, #13 Climate Action and #15 Life on Land.**

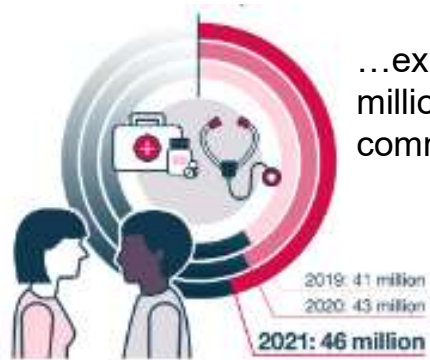
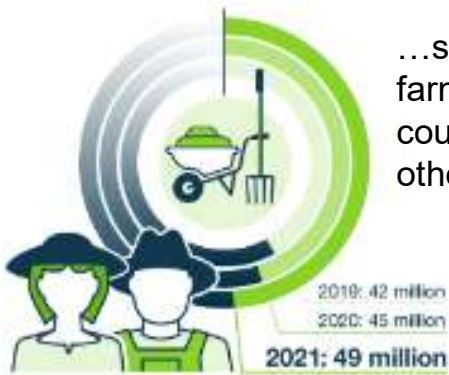


90 months to go

With our commitment to sustainability we contribute to the Sustainable Development Goals (SDGs) of the United Nations. These goals are to be achieved by 2030. Until then it will be 90 months.



Sustainability – 2030 Global Targets



...make our own production sites climate-neutral and reduce emissions along the value chain by 2030



Berkeley Site Stretch Sustainability Goals



Clean Power

Engage Everyone

Production Process
Optimization

Raise Cold Storage
Temp & Reduce Volume

Reduce Resource
Demand & Zero Landfill

Reduce physical and
offline testing

Zero Natural Gas usage

Fully digital systems and
product release



Berkeley Sustainability Goals & Projects

2022 Berkeley Site sustainability goals

- // Carbon Emission Reduction
- // Water Conservation
- // Waste Reduction
- // 100% Employee Participation

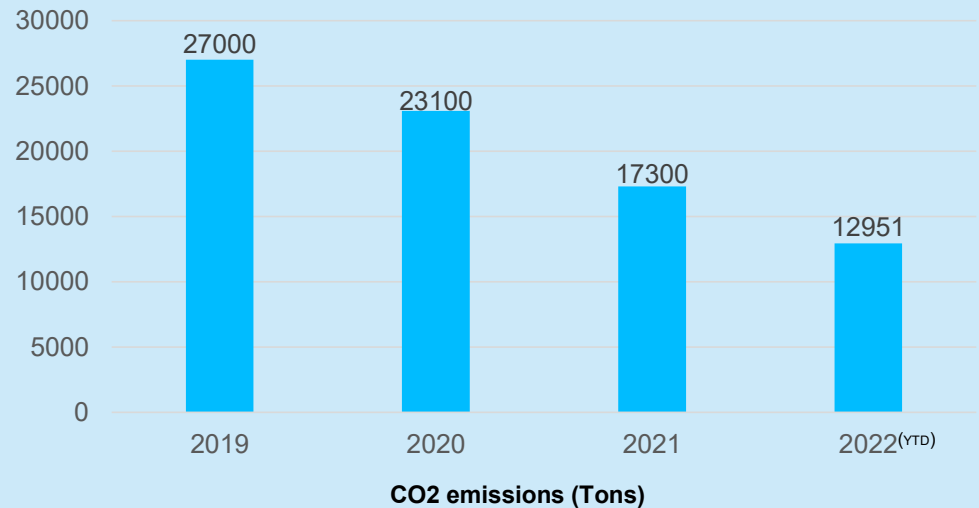
2022 Ideas & Projects

- // Freezer Optimization
- // Electronic conversion of paper-related documents
- // Building HVAC thermostat setbacks
- // Reduce Quality Control offline sampling frequency
- // Create Site Water Management Plan

Berkeley Site Carbon Emission target progress

- // **Scope 1** (direct emissions) – 10% reduction from 2019 baseline
- // **Scope 2** (renewable energy) – 100% renewable by 2030

Bayer Berkeley Site Annual Carbon Footprint





Berkeley Sustainability Council

Cross-functional Representation

- // Engineering, Production, Research & Development, Safety/Environment/Health & Security, Project Management/Operational Excellence, Site Leadership, Supply Chain, and Quality

Scope & Responsibility

- // Guide the framing and deployment of a sustainable development program at the Site
- // Set framework to engage and motivate employees and spur innovation
- // Establish and align the Site-level commitments and goals with Corporate
- // Provide tools to facilitate sustainable thinking in process and product design
- // Develop recognition programs to facilitate continued organizational focus and progress

2022 Site-Sponsored Events

- // Earth Day – Sustainability video viewing, employee stories, & Site Leadership highlights
- // Water conservation contest
- // Learn about Planting Herbs live demonstration



Current Construction - Cell Therapy Launch Center

Increasing capacity while reducing emissions

Traditional Approach

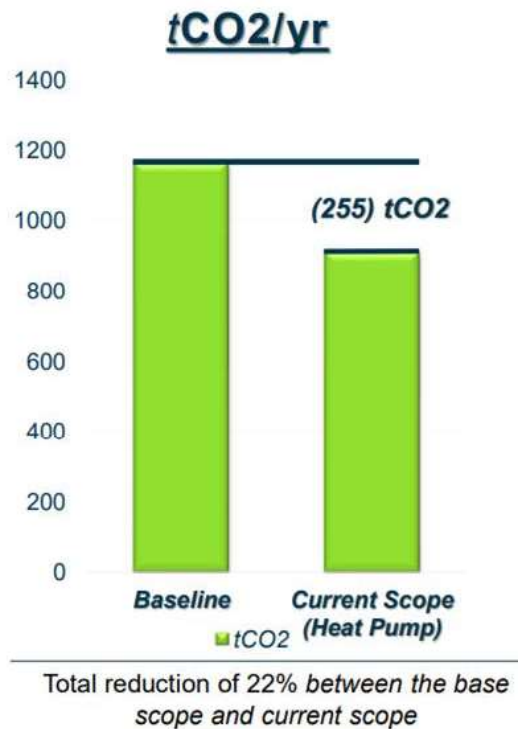
New Construction – Cell Culture Technology Center (CCTC 2/3)

- // HVAC and process cooling required chilled water & plant steam
 - // New chillers required
 - // Connection to existing plant steam distribution system
 - // **Does not supporting PH 10% CO₂e reduction, increases carbon footprint**



Heat Pumps Technology – Opportunity

Implementing heat pumps within new Cell Therapy Launch Center



- // Modular system that allows future expansion (GT Mod)
- // Will be used on future buildings at the Berkeley site
- // Implements Sustainability GEPs (ISPE)
- // Modernizes the site utility concept
- // Eliminates the need for plant steam and chilled water for the HVAC load

$$\text{Abatement Costs} = \frac{\text{CAPEX\&OPEX (renewable solution)} - \text{CAPEX\&OPEX (fossil solution)}}{\text{CO}_2 (\text{renewable solution}) - \text{CO}_2 (\text{fossil solution})} [10 \text{ Years}]$$

CT Mod Abatement Cost = -211,371

Estimated LEED Impact: +7 points

- Space Heating Efficiency Improvement: 86% from baseline
- Cooling Efficiency Improvement: 82% from baseline
- Pumping Increases: 55% higher than baseline

Note the increased pumping is equivalent to 1% of space heating



Heat Pumps Technology – Benefits

Additional Benefits

- // Building heating and process cooling are generated electrically by the heat pumps
 - // Connections to existing chilled water and site plant steam are no longer required.
 - // Modifications including equipment investment no longer required to support the Program
- // Supports LEED credits (approximately +7 points), places project in a better position to obtain LEED Gold
- // Heat pumps expected to be installed in future buildings

- // **Eliminated future steam demand (9,474 lbs/h = 4,297 kg/h), 255 tCO₂/yr reduction**
- // **Reduced capital investment budget by one-half or \$5M USD**
- // **Decreased project schedule by 16 weeks**



Closing thoughts ...

The Berkeley site has many exciting project ideas for sustainability improvements on our campus

Berkeley site competes globally for company capital investments

We are always looking for creative ideas to finance sustainability investments on the Bayer Campus in Berkeley!





Q/A

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Thank You!!

