

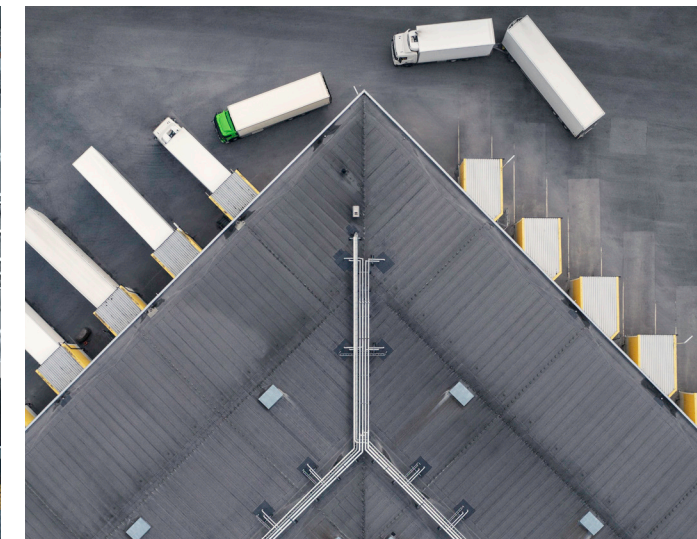
Future-Ready Food & Beverage Facilities

A Strategic Path to Sustainability



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Introduction

All companies face inherent risks when looking to make changes to their business to become a more sustainable operation. But the need to evolve is undeniable due to environmental, social, and regulatory pressures.

Food and beverage companies, in particular, have unique challenges to address as our planet's population grows. And the impact of their production and manufacturing practices extends far beyond profitable business results for their stakeholders. Global food security is dependent on innovative, safe, and sustainable production from facilities that can keep pace with the rapid changes in our world.

Sustainable operations are intentional and best deployed when comprehensively planned for maximum cost-efficiency and system integration. Black & Veatch works behind the scenes to keep food and beverage manufacturers ahead of the net-zero curve by using digital data and processes to plan and design optimized food and beverage facility systems.





Food & Beverage Facility Systems

Integrated Water/Reuse

When looking to improve upon the sustainability footprint of a food and beverage facility, water conservation and reuse are critical considerations.

Both established manufacturers and emerging companies need to look to their water demands when setting and executing plans for carbon neutrality and energy independence.

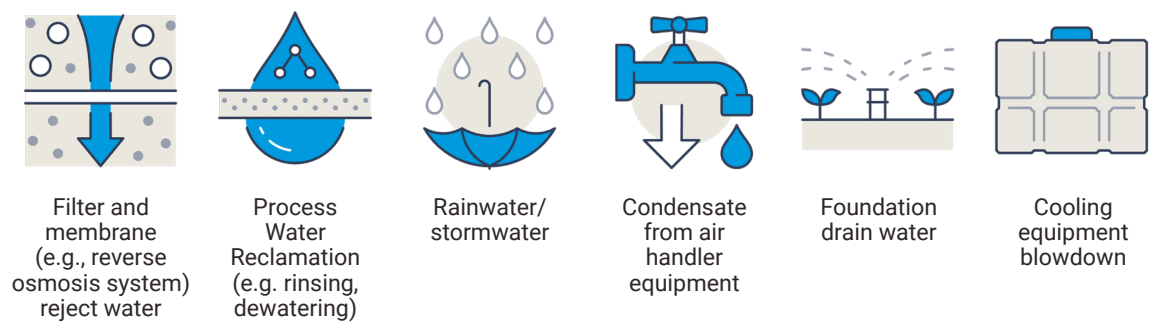
A unique challenge faced in process design at food and beverage manufacturing facilities is hygienic/sanitary design. Entire operations can come to a halt if these systems fail, causing loss of both time and raw materials.



Whether building a brand-new space or improving upon an existing operation, consider the following when planning for a future-ready food and beverage facility:

- 1 Conduct a water audit, condition assessment, and evaluation to characterize water use, locate and fix leaks, and identify discharges that may be reused
- 2 Choose water-efficient fixtures, machinery, and equipment
- 3 Align facility processes with sustainability goals
- 4 Lean on integrated water design, digital tools, and operation & maintenance solutions to guide efficient water use
- 5 Look for incentives. Some water, wastewater, and energy utilities offer incentives when facilities make process changes that improve water or energy efficiency

Manufacturing facilities could potentially reuse water from several onsite sources such as:



Resilient, Decarbonized Energy

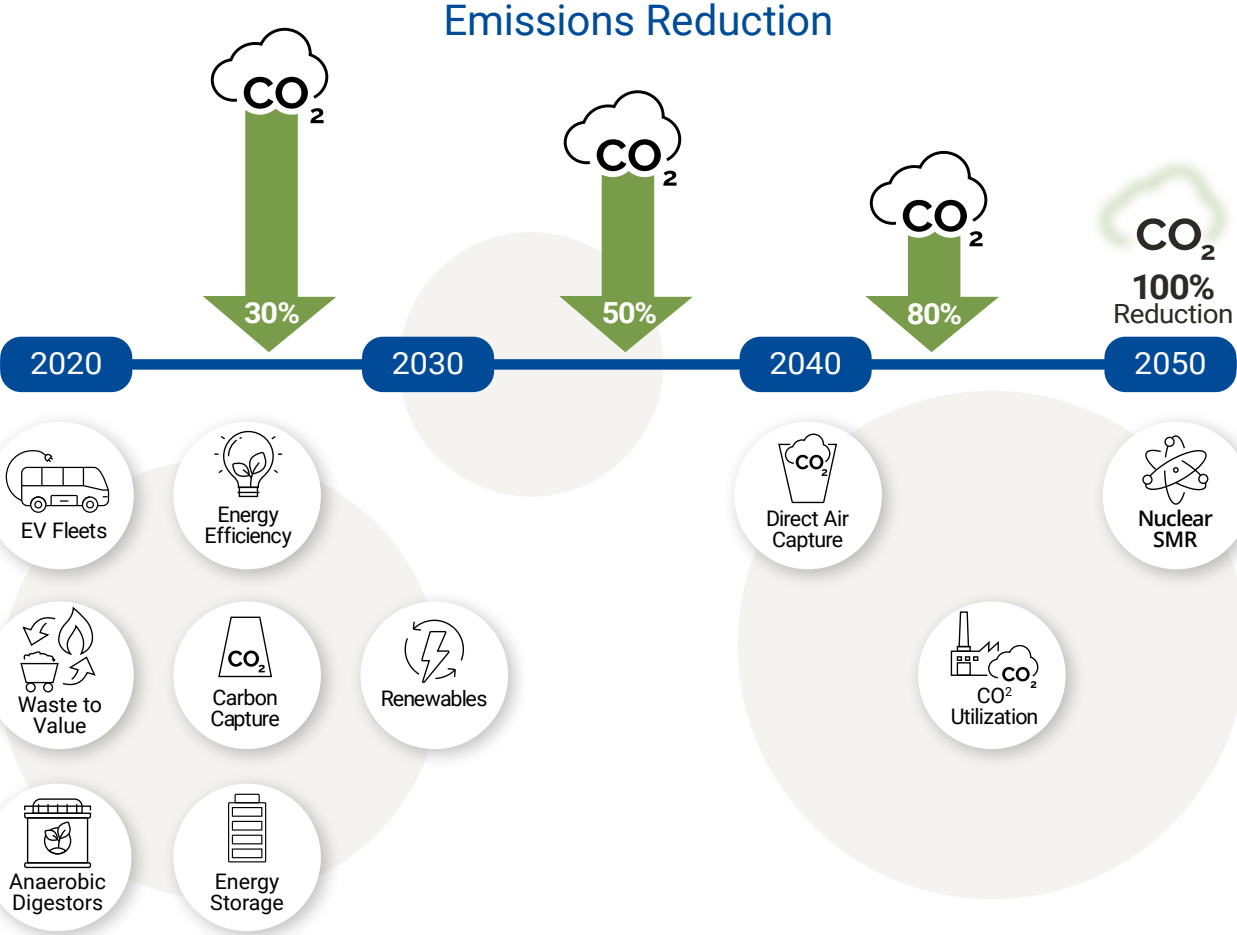
No matter the industry or facility type, a carbon-free strategy requires the same key steps: plan, assess, integrate.

For food and beverage manufacturers, the planning and investments needed to reach sustainability goals are met with the challenge of keeping up with increasing production demands to meet a growing global food supply chain. And it's a complex, delicate system affected by everything from changing climate patterns and evolving dietary preferences to stricter regulations and international health crises.

None of these variables indicate any sign of going away, either. As landmark legislation around all-electric buildings continues to hit the books, developers in some states are shifting from natural gas in favor of electric-ready design to reduce carbon outputs of their buildings. [Fifty-four districts in California alone have established building decarbonization ordinances.](#)¹

External variables aside, reliable and resilient energy is a priority for any food and beverage manufacturing facility. If systems go down, revenue loss is inevitable. All stakeholders—investors, developers, farmers and facility workers—rely on strategic planning that prepares their facility to adapt to extreme environmental, social and regulatory risks.

¹ RMI, 2021



Clean Transportation Considerations

According to the Department of Energy, [14 states and 27 cities have implemented mandatory electric vehicle infrastructure code provisions](#)² as part of new commercial and residential development.

Following rising EV adoption trends and stringent decarbonization goals, similar laws will likely expand across North America. The transportation and logistics of moving products through the supply chain can significantly impact a company's carbon emissions.

Is the timing right for your facility? Will your selected site be conducive to efficient operations? Consider the following:

1 Clean Freight Can Make a Big Impact

The [Joint Electric Scaling Initiative \(JETSI\)](#), launched in 2021, is the largest single deployment of battery-electric Class 8 trucks to date. The initiative will mitigate the negative health impacts of goods movement-related air pollution. Replacing the diesel-powered trucks with electric vehicles, powered by solar energy, will reduce 8,200 metric tons of greenhouse gas emissions, and displace five metric tons of criteria pollutants each year.

2 The Technology is Here Now

Clean transportation vehicles have been hitting the road for years and the speed of technology to transportation continues to grow exponentially. Zero-emission pick-up trucks, delivery vans, refrigeration units and semi-trucks are in production and starting to deliver. Planning now for future power needs will maximize your cost-efficiency and ensure sufficient clean power is available when you and the vehicles are ready.

3 The First Movers Are Moving

Ten companies, including Frito-Lay, Penske, Anheuser-Busch and UPS, put electric trucks to the test with real loads and freight. The North American Council for Freight Efficiency (NACFE) led the three-week Run on Less electric truck demonstration to show how technologies can improve the bottom line for fleets. Results, data, and participant profiles are available at [runonless.com](#).



The California Joint Electric Truck Scaling Initiative (JETSI) demonstration project will reduce **8,200 metric tons of greenhouse gas emissions**, and displace five metric tons of criteria pollutants each year.

² [Pacific Northwest Laboratory](#), 2021





Food & Beverage Facility Site Selection



Keys to Food & Beverage Site Selection

By integrating sustainable principles into all aspects of site selection, organizations can build a cost-effective, resilient design that works in sync with the environment and local communities, and ultimately, achieve businesses financial goals while allowing for future scale-up.

Financial Incentives

While financial incentives to build in certain states and counties are a major factor in site selection, the industry is beginning to see a shift during site selection to begin with both sustainability and existing, local infrastructure in mind first. Existing municipal infrastructure (water and wastewater, electricity, etc.) allows for a more expeditious speed-to-market for your facility. Additionally, by working at the local level, other site development requirements, like permitting and local labor workforce, can be more easily and quickly implemented.

Resilient Sites

With the in-house approach, a further decision can be made. Do you own the facility, or lease a building for your needs? Or, even if you own the facility, do you operate it with internal personnel or outsource the operating function? For contract manufacturing, you can consider outsourcing the entire manufacturing function, or just a portion of it.



Sustainable by Design

Food and beverage producers have the power to design facilities at the intersection of innovation and sustainability. And by building or improving your facility with a carbon-free future in mind, your reputation as a sustainable company increases the marketability of the products you manufacture and that of your entire brand.

Environmental Considerations

Environmental Considerations

Next-generation facilities are designed to be sustainable. With current demands on the world's food supply chain already pushing existing environmental systems, preparing a facility to be future-ready in a sustainable way means taking ecosystems both inside and outside the facility into consideration.

Climate Trend Analysis for Risk Mitigation

Analysis of large-scale climate trends can expose potential climate threats that facilities may sustain in years to come. As severe weather events across the globe continue to impact physical assets, supply chains, and people, understanding and mitigating risks is essential to ensuring resilience. Physical climate analytics assess whether existing infrastructure and/or physical assets will sustain damage or impairment due to extreme weather and climate change. These quantitative and qualitative insights can help organizations understand what, where, and when they should prioritize climate risk mitigation.

Geographic Information System (GIS) Tools to Maximize Cost Savings

Developers can use GIS-based automated routing tools to analyze geographic data sources as a part of the site selection process to maximize cost savings and achieve sustainability goals. Nationwide maps and GIS data can provide routing analysis anywhere within the U.S., but more custom routing analyses should be considered to address raw material delivery routes, finished goods delivery, and other critical operations considerations.

Infrastructure Rating Tools to Reduce Emissions and Energy/Water Use

Additionally, sustainable development can benefit from infrastructure rating tools such as [Envision](#)™ that measure and track resource use. Through data analysis, these tools help identify local sourcing options and reduce emissions, energy, and water use. Developers can increase resource stewardship without sacrificing functionality or cost by aligning sustainable goals with data analysis tools.



What does “environmentalism” mean to food processors?

According to a study conducted by [BNP Media's Clear Seas Research for Black & Veatch](#), food and beverage companies want to embrace a more altruistic approach to improving their sustainability footprint, but they must also see accompanying improvements in their operations and bottom line.

“We believe in the whole circle—**our first factory is the earth**. We need to support our systems from seed to table.”

“How to use Earth’s resources as **efficiently and safely as possible**. How to avoid negatively affecting our communities and environment.”

“The process is to evaluate the best attainable product with the **least damage** to our environmental resources.”

“Recyclability, planting trees back to replenish deforestation, fair trade, fair wages; plastic reduction, **decrease in single-use plastic**.”

Conclusion

The challenges of feeding a growing global population are met with headwinds nearly every step of the way. To grow a food and beverage business both sustainably and profitably requires careful consideration and strategies that serve business stakeholders while also mitigating geopolitical and environmental risks.

This is where sustainable design comes in. Investors, developers, and building owners need solutions to employ cleaner versions of essential manufacturing operations, reduce intensive resource consumption, and evolve their systems to be future-ready in a decarbonized era.


A holistic solutions provider, like Black & Veatch, can integrate smart facility functions with an eye on the future to plan, conceptualize, build and even accommodate retrofits for energy and water-use technologies as they mature.

The future of the food and beverage companies has never been more exciting and promising. Regulations, consumer demands, and environmental stewardship are all trends that are reshaping our food systems, driving innovation to solve global food security, and creating more sustainable products and facilities.

Read Our Other eBooks to Stay Ahead of the Net-Zero Curve



Want to design sustainability and energy resilience into your facility?

Contact Us 



Our mission is to build a world of difference through innovation in sustainable infrastructure. We help organizations integrate a range of technologies to cost-effectively achieve resilience, sustainability, and growth.

