



A CASE STUDY

Reducing headaches. Saving money.

With more access to energy and refrigeration data than ever before, HelloFresh has decreased energy and maintenance costs while also earning new revenue.

// Axiom's AI enables us to more intelligently maintain our refrigeration assets, increase uptime, and save money month after month. We look forward to deploying Axiom's apps in additional HelloFresh facilities throughout North America."

Brandon Preston

Vice President of Safety, Maintenance
and Reliability Engineering,
HelloFresh





Summary

In just over six months, HelloFresh has reduced refrigeration energy and maintenance costs significantly by using Axiom Cloud's Facilities Analyzer™ and Virtual Battery™ apps in one of its U.S. facilities.

Challenge

HelloFresh, the world's leading meal kit provider, has been expanding rapidly over the past decade. Of course, with this expansion in customer base comes an increased need for production and distribution capacity. HelloFresh's fleet of fulfillment centers has grown through acquisition of existing facilities as well as new greenfield facilities, which has led to different refrigeration equipment, control systems, and maintenance requirements across the fleet.

Driven by a desire to reduce complexity and an obsession with operating a data driven enterprise, HelloFresh sought tools to reduce energy consumption, emissions, and refrigeration maintenance costs. HelloFresh had also committed significant resources to two key environmental targets that were set in 2020:

Target 1

Reduce the amount of food waste sent to landfill or incineration from all of our facilities by 50% per euro of revenue by the end of 2022 (from a 2019 baseline).

Target 2

Reduce the amount of CO₂ emissions from our production facilities by 60% per euro of revenue by the end of 2022 (from a 2019 baseline).

In order to hit these targets while also reducing operational costs, HelloFresh knew they had to find a partner that deeply understood their most energy intensive and mission critical assets - their refrigeration systems.

// **Axiom has helped us significantly reduce the Scope 1 and Scope 2 emissions from one of our fulfillment centers by lowering our refrigerant leak rates and reducing energy consumption. HelloFresh's target is to reduce emissions from production facilities by 60% per euro of revenue by the end of 2022, and Axiom Cloud is helping us make measurable progress toward that goal."**

Jeffrey Yorzyk

Senior Director of Sustainability,
HelloFresh



Solution

Meal kit suppliers like HelloFresh rely on refrigeration as a key part of their business. By packing and shipping made-to-order meals directly from their fulfillment centers, HelloFresh's operations emit 82% less CO₂ per euro of revenue than traditional food retailers, which need to cool, heat and light thousands of stores. Instead, HelloFresh meal kits are generally packed, stored, and shipped in batches from the refrigerated fulfillment center closest to the customer.

HelloFresh operates production facilities all over the United States, but, with the help of Axiom, they identified one fulfillment center to pilot Axiom's Facilities Analyzer and Virtual Battery apps.

Axiom Cloud's apps were easily integrated into the site's refrigeration controller from Logic Technologies, allowing hundreds of existing data streams to be sent to the cloud.



Facilities Analyzer

Facilities Analyzer

Once the integration with the existing refrigeration controller and equipment was built, the first step was to install Facilities Analyzer to give HelloFresh detailed visibility into all of their refrigeration and energy data in a single, convenient dashboard. Using this same data, Facilities Analyzer is also able to identify and diagnose refrigeration issues before they can turn into emergencies.

Through Facilities Analyzer, HelloFresh also received two features that are usually included with Axiom's Virtual Technician app—continuous commissioning (CCx) and refrigerant leak detection. With these features, HelloFresh receives notifications detailing energy-saving opportunities or slow refrigerant leaks that otherwise may go unnoticed for months at a time.

Once each issue or opportunity is diagnosed, a highly contextual notification is sent to the proper stakeholders. These notifications include the root cause, urgency, estimated financial impact, suggested actions, and a snapshot of the most relevant data, all of which help make the resolution as simple as possible.

When applicable, notifications can be batched and triaged across multiple facilities based on urgency and impact. And, when an issue is resolved, it is automatically marked as such in Axiom's Customer Web Portal and Performance Reports based on actual data from the facility.



Virtual Battery

Virtual Battery

The next step was to install Virtual Battery, an app from Axiom Cloud that transformed HelloFresh's low temperature (frozen) refrigeration system into an intelligent, flexible resource. Using power meters that were installed on the building's main meter and each compressor rack, along with refrigeration data from the existing controller, Virtual Battery is able to forecast building and refrigeration loads. With these forecasts, the app then generates a pre-cool and load shed schedule that will minimize the facility's energy and demand charges.

During pre-cooling mode, Virtual Battery sends commands to the refrigeration controller that slowly decrease the temperatures of the low temperature spaces, allowing cooling to be stored in the same way one would charge a lithium-ion battery.

After pre-cooling, Virtual Battery commands load shed, during which compressors are modulated to allow the space temperatures to safely come back up to their original setpoints. Space temperatures are constantly monitored and operation is adjusted accordingly to ensure food safety.

By load shedding at the correct times, Virtual Battery automatically helps HelloFresh reduce peak demand, shift energy consumption to off-peak hours, and earn thousands of dollars in demand response revenue from their utility.

Results

During the first seven months of operation, Facilities Analyzer detected seven unique anomalies at HelloFresh's fulfillment center. The estimated impact of these anomalies ranged from a one-time fix that would save a few thousand dollars all the way to a simple setpoint change that would save over \$20,000/year in energy costs.

By automatically identifying these anomalies, sharing relevant data, and suggesting specific resolutions, Axiom Cloud was able to generate approximately \$50,000 in value at this facility. A summary of a few of these anomalies can be found in the table below.



Anomaly Type	Urgency	Description and Root Cause	Estimated Savings
Setpoint Change	Low	Condenser Head Pressure setpoint is higher than necessary. This results in increased energy usage throughout the year.	\$23,000/year
Floating Suction Pressure	Low	LPR2 suction float controller is disabled. This results in increased energy usage from a lower than necessary suction pressure setpoint.	\$8,000/year
Subcooler Maintenance	Medium	The liquid subcooler is not able to maintain liquid outlet temperature setpoint, reducing capacity of all circuits by ~10%. This is likely due to a malfunctioning subcooler solenoid valve or thermal expansion valve (TXV).	\$5,000
Oil Filter Replacement	Medium	Oil filter pressure differential is increasing over time, suggesting that the filter needs to be replaced. High differential could prevent oil from feeding to LPR 2 CMP 1, leading to an oil fault.	\$6,000

“The Axiom apps are designed to provide value autonomously behind the scenes. However, HelloFresh has proven to be a sophisticated and engaged partner – it has been amazing to see the results we can produce by supporting the HelloFresh team with predictive insights and automation.”

Amrit Robbins
CEO,
Axiom Cloud



Through Virtual Battery, HelloFresh is able to earn Demand Response revenue and shift energy away from the 4-9 PM peak period without any impact to facility operations. Demand Response revenue is expected to total over \$9,000/year from this facility alone, and energy bills are expected to be reduced by over \$20,000/year, with much of the benefits coming in the four summer months of June - September.

// Because of predictive insights from Axiom, we decided to perform subcooler maintenance rather than adding thousands of pounds of refrigerant as our maintenance provider recommended. This single event saved us more than the annual costs of Axiom's apps. Axiom's AI enables us to more intelligently maintain our refrigeration assets, increase uptime, and save money month after month. We look forward to deploying Axiom's apps in additional HelloFresh facilities throughout North America."

Brandon Preston

Vice President of Safety, Maintenance
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Based on the results to date, HelloFresh is expecting a 3.1x return on their annual subscription fees and a payback period of significantly less than one year from Axiom Cloud's apps. Along with these cost savings comes a significant reduction in both Scope 1 and Scope 2 carbon emissions.

Conclusion

In just over six months, HelloFresh has reduced refrigeration energy and maintenance costs significantly by using Axiom Cloud's Facilities Analyzer™ and Virtual Battery™ apps in one facility. These benefits have come from reduced refrigerant leak rates, avoided refrigeration outages, energy efficiency recommendations, demand response revenue, and more.

As part of HelloFresh's goals to become more sustainable and data-driven in their refrigeration operations at production facilities, Axiom Cloud and HelloFresh are currently in discussions about expanding this program to additional facilities.

Contact Info

Axiom Cloud's mission is to use software and automation to transform how the world's cooling systems are powered, operated, and maintained, in order to generate significant climate and financial impact. Axiom's team of refrigeration experts, data scientists, energy nerds, and software developers solves retail grocery's biggest energy and maintenance challenges by layering intelligence onto their existing refrigeration systems. Learn more at www.axiomcloud.ai

HelloFresh is the world's leading meal-kit company and operates across 17 international markets. In 2020, HelloFresh delivered more than 278 million meals to customers across the U.S. With a focus on helping Americans eat more sustainably, HelloFresh is the first carbon neutral meal-kit company. HelloFresh was named America's Best Customer Service for Meal Kits in 2020 and voted the Most Trusted Meal Kit Delivery Service in America in 2021 and 2022 by Newsweek. HelloFresh was founded in Berlin in November 2011 and has U.S. offices in New York, Chicago, and Boulder. For more information, visit www.hellofresh.com

