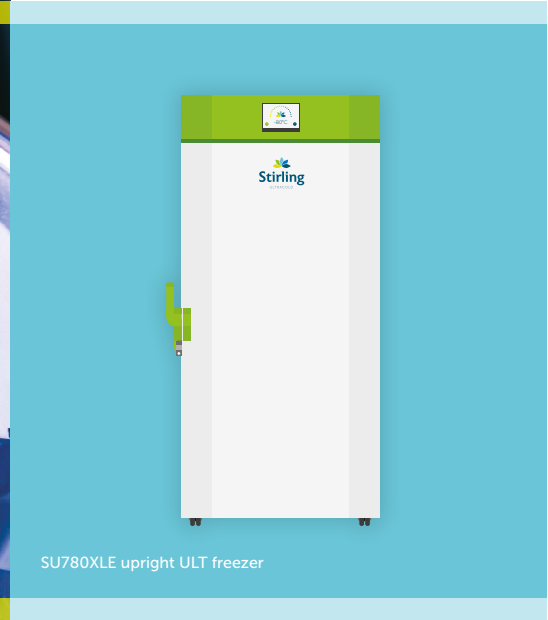


BIOREPOSITORY CASE STUDY



SU780XLE upright ULT freezer

SCISAFE REDUCES ULT STORAGE COSTS AND EARNS ENERGY REBATES WITH STIRLING FREEZERS

When SciSafe decided to replace several aging ultra-low temperature (ULT) freezers across their facilities, they explored several of the commercially available manufacturers, discovered one model wasn't like the others and selected Stirling Ultracold SU780XLE freezers to see immediate relief with their annual operating spend.

BACKGROUND

Over the last ten years, SciSafe has quickly established itself as a world leader in biological and pharmaceutical storage. They have become known for offering a more tailored biorepository approach and offer flexible customer-focused solutions with unparalleled customer service 24 hours a day, 7 days a week, 365 days a year. Trusted by many of the world's most admired organizations to store and manage

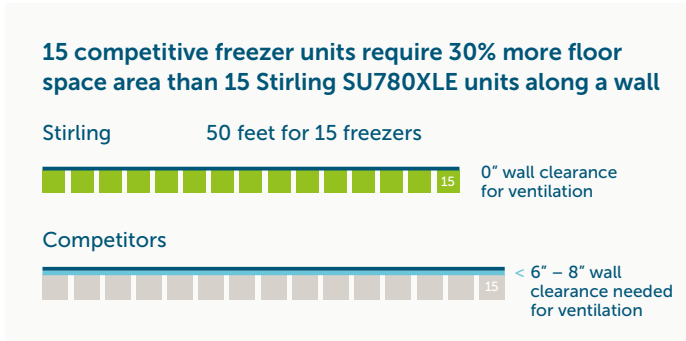
critical samples, specimens, tissues and cells, their goal as an organization is to provide the highest level of protection possible for their clients most valued research.

To uphold their mission, they routinely update and upgrade their equipment. ULT freezers are a big part of their equipment roster and many were aging beyond their Standard Operating Procedures (SOP). After initial testing and evaluation to compare the different commercial freezer options available, SciSafe ultimately selected Stirling Ultracold freezers to replace their legacy ULT freezer population and are now standardizing on Stirling models across all facilities, realizing immediate benefits to their operation.

By virtue of its efficient free-piston Stirling engine, the first ENERGY STAR®-certified upright SU780XLE from Stirling Ultracold reduces energy costs and operating carbon footprint, while also qualifying them for energy incentive rebates from their regional electric utility provider.

OPERATIONAL ENERGY EFFICIENCY

SciSafe projected that replacing aging freezers with new Stirling SU780XLEs would deliver significant operating cost savings from reduced freezer energy use, lower HVAC requirements and saved floor space. The image below depicts a comparison of 15 Stirling freezers with 15 competitive units, gaining 30% more floor space for additional sample storage.



At -80°C, the Stirling Ultracold SU780XLE upright freezer uses up to 75% less energy than standard compressor-based ULT freezers with reduced HVAC requirements because they reject proportionally less heat than a typical compressor-based ULT system.

That translates into immediate savings in laboratory energy consumption, a comfortable working environment and ultimately, significant cost savings over the freezer's lifetime. Stirling Ultracold was the first ULT freezer manufacturer to meet the ENERGY STAR® standard for laboratory grade refrigerators and freezers in the ULT category certifying the SU780XLE as the most energy-efficient ULT freezer (.29 kWh/day/ft³).

THE ENERGY REBATE VALUE ADD

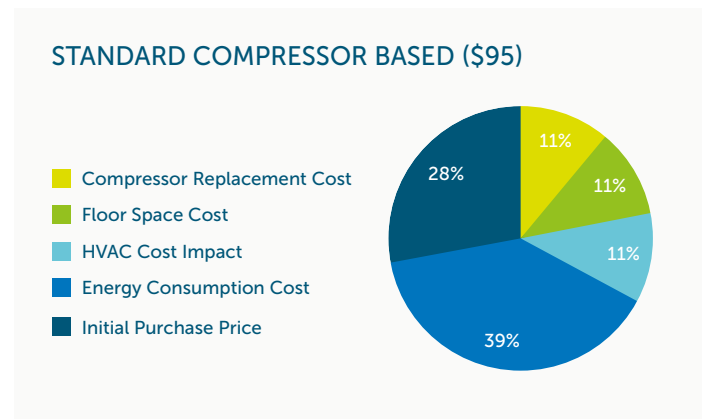
The advantages mentioned above have also garnered the attention of several electric utility providers, who have begun offering prescriptive utility rebates for replacing standard compressor-based cascade freezers with Stirling units. While savings will depend on how many freezers you replace and the specific rebate your energy provider offers, SciSafe was awarded thousands for their efforts.

As we have done for many research and biobanking organizations, the Stirling team worked with the local utility company on SciSafe's behalf to secure \$15,600 in prescriptive energy rebates for replacing inefficient, legacy ULTs with units at their initial site. **This rebate earned SciSafe more than the equivalent value of a free Stirling freezer and is being continued at all of their relevant locations!**

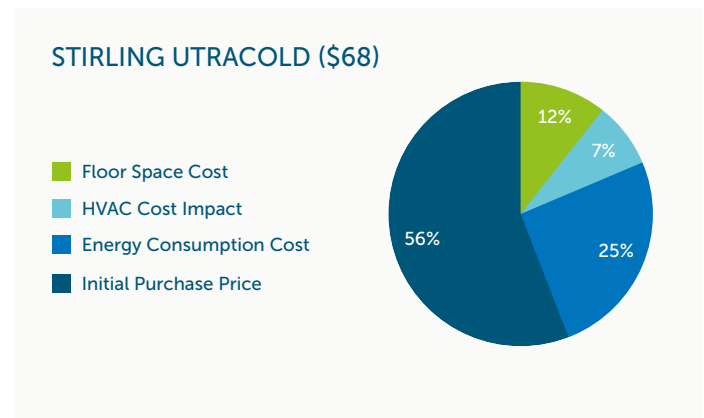
TOTAL COST OF OWNERSHIP

When selecting energy efficient ULT freezers to replace legacy freezers in any biorepository or lab, total cost of ownership (TCO) must be considered. The TCO for an ultra-low temperature freezer is the sum of the purchase price, plus energy costs for freezer operation, additional HVAC, floor space and the expected compressor replacement in a typical freezer's lifetime. In fact, the initial freezer purchase price actually only accounts for less than 30% of the total cost of owning a typical ULT freezer.

ULT freezer percentage of total lifetime cost (cost per cu. ft. of storage per year – U.S. Market)

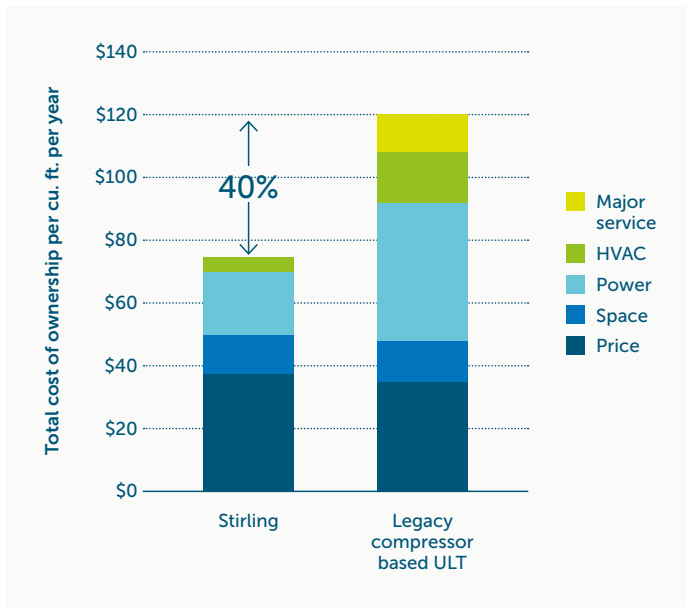


Based on installed base energy use data at 16c/kWh electric costs, with typical floor space and compressor replacement cost estimate from independent sources.



TCO = Purchase Price + Freezer Operational Energy Cost + HVAC cost to dissipate heat + Floor space for sample storage + Compressor Replacement

As SciSafe has discovered, the Stirling Ultracold SU780XLE freezer drives value and operational savings over the lifetime of the unit. Even if the initial purchase price of a compressor-based freezer were free, the Stirling Ultracold unit would often still be cheaper on a total lifetime cost basis.



THE VALUE OF PEACE OF MIND

When it comes to critical sample protection, biorepositories like SciSafe rely on freezer insights and strict SOPs to avoid temperature excursions, eliminate handling errors, or prevent delays within the sample management process. Biorepositories are responsible for maintaining the cold chain of custody as samples are extracted for downstream processing, research or clinical applications and their management teams often look to intelligent data, data-analysis, predictive learning tools and monitoring services to safeguard their work. For SciSafe, Stirling’s advanced reliability and monitoring capabilities with freezer connectivity provides ULT freezer insights, invaluable confidence in performance and peace of mind sample protection.



SUSTAINABILITY MUST BE A GLOBAL MISSION

The growth of biopharmaceuticals and newer modalities within pharmaceutical research and development has driven the need for SciSafe, and many other biorepositories, to invest in a sustainable and reliable infrastructure to preserve highly temperature-sensitive materials, with a reduced carbon footprint. In the developed world, nearly 97% of total energy use (carbon footprint) is dominated by electrical use in operation. Stirling Ultracold freezers were the first in the United States to use 100% natural refrigerants and produce one-third less electric power than a standard compressor-based freezer. SciSafe’s operations get greener with each legacy freezer replaced.

CONCLUSION

SciSafe and Stirling Ultracold together will continue to make a positive impact on science, our world and the future of medicine with energy-efficient, sustainable efforts across the globe. Delivering maximum lifetime value for customers with unique, point-of-use solutions for ultracold storage of advanced treatments in the clinical and biorepository environments will continue to be critical. Is it time to replace your freezers?



To learn more about Stirling Ultracold’s SU780XLE ultra-low temperature freezer, visit:



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