



**ATMO**  
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Business Case for  
Natural Refrigerants

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# Rooftop Ultra-Low Charge Ammonia Refrigeration-a case for Change:

**KONOIKE**

**GENERAL**

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# Background/Overview

- General Cold Storage was started in the late 80's. With little capital for investment, our location was leased and mostly built with used racking and refrigeration equipment. As the business began to grow, we were able to reinvest in the infrastructure. However, putting good capital dollars on old capital equipment and an old building was not a good model for success.
- In 2007, General Cold Storage was sold to KPAC. The desire to improve operations and possibly build a new facility was reignited.
- After 25 years of occupying a deteriorating leased facility, that included a "Heinz 57" of outdated patchwork R-22 Refrigeration packages, 40 plus year old racking, it was time to look at options. In late 2014, we purchased a parcel of land in South Gate, CA. The Dream was at hand.
- The Decision to move away from an inefficient deteriorating building and build our own Refrigerated Warehouse, provoked the next question: what type of refrigeration system would we like in our new facility?

Every situation is unique and the thought process we used for determining the answer to that ginormous question was practical and stood to reason. Any of you looking to move in that direction will have your own reasons and answers to that question. What follows was our practical approach to our situation:

Our ground work was set. We looked at some of the obvious comparisons between the latest technology (Rooftop ultra low-charge Ammonia packages) and the conventional flood type systems. Our approach and comparisons between the two follows and our conclusion will be made apparent for our situation.

# Building the Case – Ultra-Low Charge Ammonia

	Roof Top Low-Charge System		Conventional System
Building Sq. Ft (82,000)	82,000		82,000
Refrigeration Cost	\$2,200,000		similar
Ammonia* Charge	40-50 gals total 15-30lbs/unit		1,000+ gals
Space for Engine Room	No floor space required Roof mounted		2,500 sq. ft.
Liability	Ultra-Low		High
Quantity of Pallets Gained	500-550		0
Gross Rev Per Pallet (annual)	\$330-\$350		\$330-\$350
Incentive Programs	x		x
Savings by design	x		x
Energy Efficiencies	x		x
Maintenance efficiencies	x		

# Building the Case – Revenue Projection (Annualized)

	Roof Top Option		Conventional
Average Revenue per Pallet	\$330-\$350		\$330
Additional Pallet Capacity	500-550		0
Average Occupancy Rate	85%		N/A
Annual Revenue Advantage	\$140,250-\$163,625		\$0
Revenue Opportunity @100%	\$165,000-\$192,500		N/A

# Building the Case – Other Cost Savings with NXTCOLD

	Prior Facility in Bell Gardens 8,500 plts		New Facility in South Gate 13,200 plts	Percent Increase (Decrease) 43%
Pallet Positions				
<b>Energy*</b>	2.0m cu. ft. Avg. \$25K		2.6m cu. ft. Avg. \$20k	<b>30%</b> <b>(20%)</b>
<b>Operational** Potential Liability</b>	Freon (phasing Out): Low risk to Person & Product. Bad for Environment		Ultra Low Charge Ammonia: Low risk to Person and Product. Natural element <b>Green</b>	

\*Our available volume of space increased by 30%, while our Energy costs decreased by 20%.

\*\*Operational costs should be lower for maintenance since all components are localized in the penthouse. Administrative cost would also be reduced due to less compliance and regulatory filings. Finally, personal and product risks are reduced based on the low charge units holding less than 5 gals of ammonia each. It's a Green natural element.

# Building the Case – Project Summary

	LC Roof Mount		Conventional
Total Project Cost	Similar		Similar
Total Potential revenue Gain	\$165,000-\$192,500		0
Realized Energy savings	<b>50%</b>		<b>Some energy savings?</b>
KPAC General Energy Savings	\$180,000-\$210,000.		?
Combined Projected Revenue & Cost Savings	\$345,000-\$402,500		?
Potential Savings By Design Incentives	\$80,000.		?
Reduced Liability & Admin- regulatory compliance	TBD		N/A
Lower Maintenance cost	TBD		?
<b>Total</b>	<b>\$425,000-\$482,500</b>		<b>?</b>