



Ammonia/CO₂ System Offers Mainstream Solution

Presented by CIMCO & Danfoss



Benoit Rodier – Director of Business Development, CIMCO Refrigeration

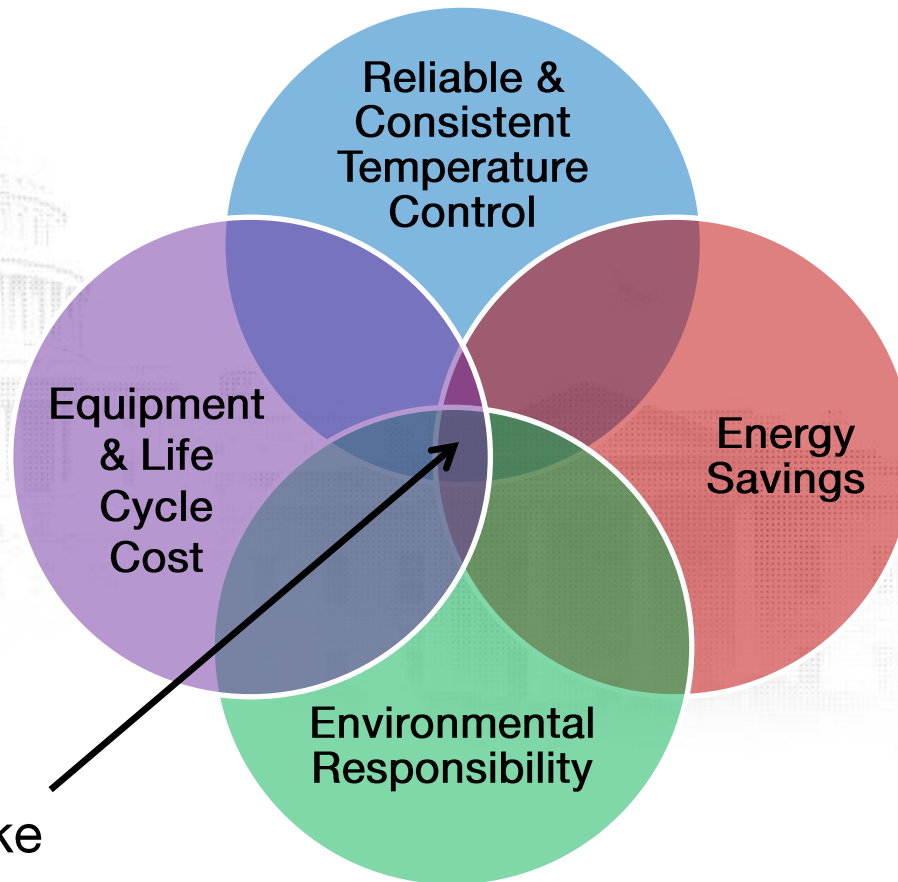
Benoit holds a BS Mechanical Engineering from Sherbrooke University and is a licensed Professional Engineer. Benoit started his career as an HVAC Manufacturer Rep and Sales Manager for heat exchangers and industrial compressors. He was recruited by Cimco in 1999 where he has held various positions, including Sales Manager, General Manager, and Director of Business Development. Benoit has worked with natural refrigerants for over 20 years. He is involved in many local and regional trade associations. Benoit was the driving force for Cimco to evolve towards CO₂ refrigeration and new technologies while maintaining its leadership position in ammonia industrial and recreative market.



Jim Hower – National Sales Manager, Danfoss

Jim Hower holds a BS in refrigeration technology from the Pennsylvania College of Technology. Since 2006, Jim has been with Danfoss holding various positions from technical and engineering to sales and management within the industrial refrigeration business sector. With the support of Danfoss Jim is a frequent contributor and supporter of many national and international industrial refrigeration industry groups, associations, and training programs focusing on driving the industry forward to meet today's new challenges.

Expanding Food Processing into the Future



The Cold Chain industry is continuously challenged to strike a balance

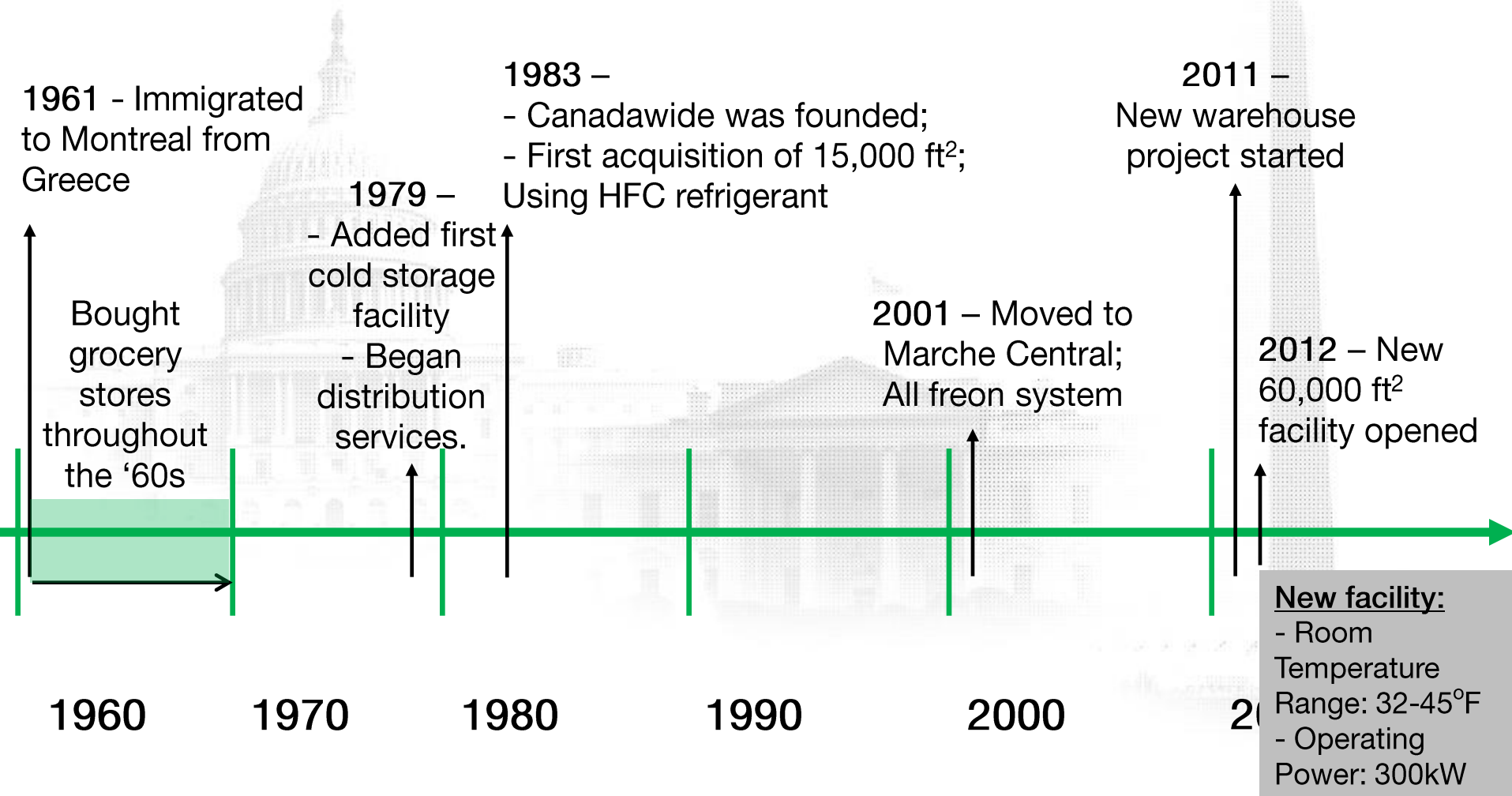
For one of Canada's largest distributors of fruits & vegetables, reaching this correct balance dictated its future direction of warehousing and delivering freshness



From nature to market in expert hands



Canadawide Milestones



Engineering Specification

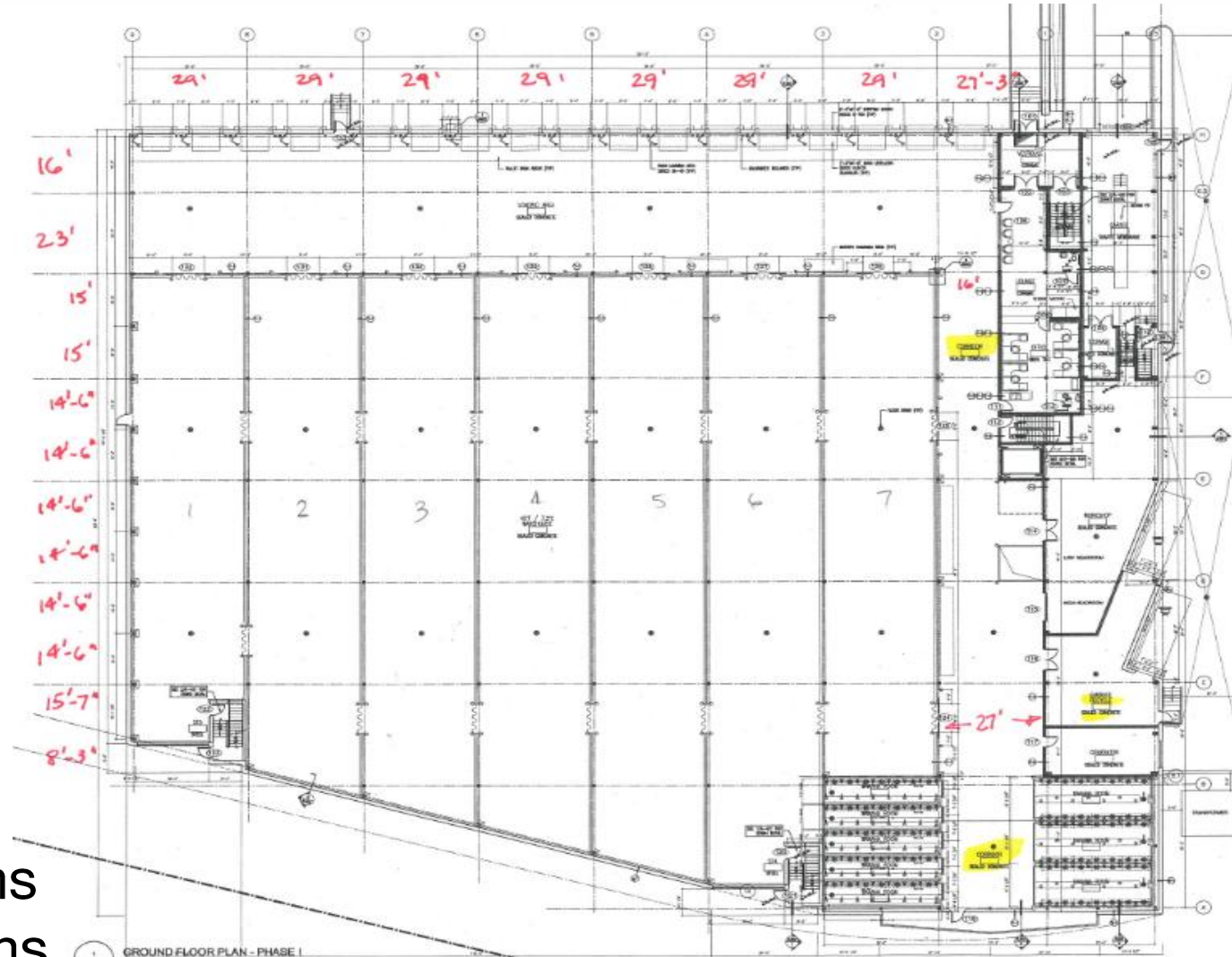
➤ Freon system with secondary glycol loop in the circulation room

Selection Criteria:

- Operating Costs
- Optimize capital cost with maintenance costs
- Efficient system
- Proven technology
- Fast delivery
- Mechanical system favorable to the good will and comfort of occupants
- Heat conservation technique to be used
- Secondary fluid in the room; no direct refrigerant

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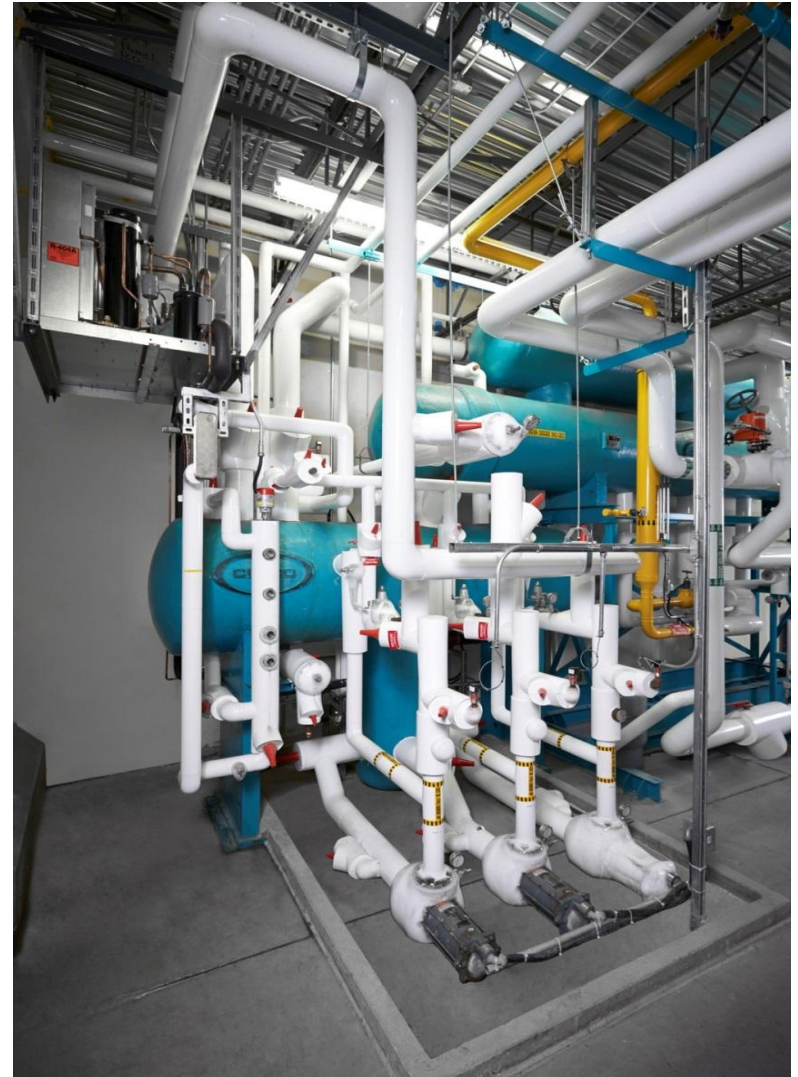
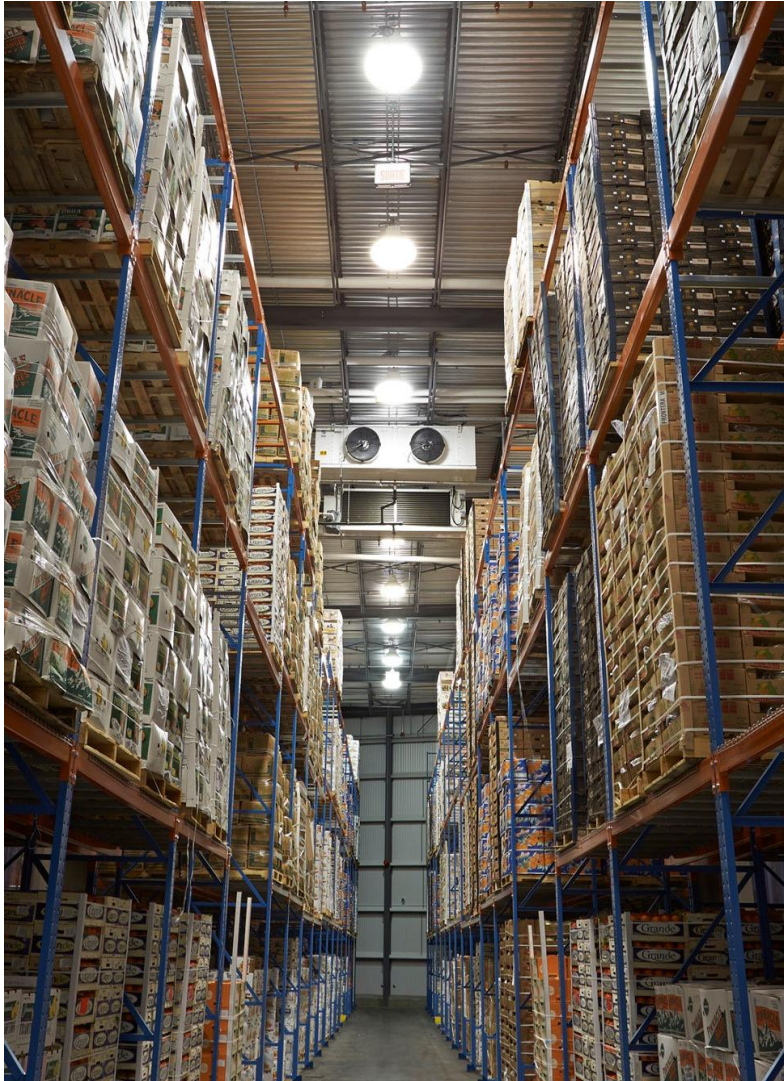


60,000 ft²

- 7 Coolers
- 17 Door Dock Areas
- 8 Banana Rooms
- 3 Process Rooms

#7 Ammonia/CO₂ System Offers Mainstream Solution

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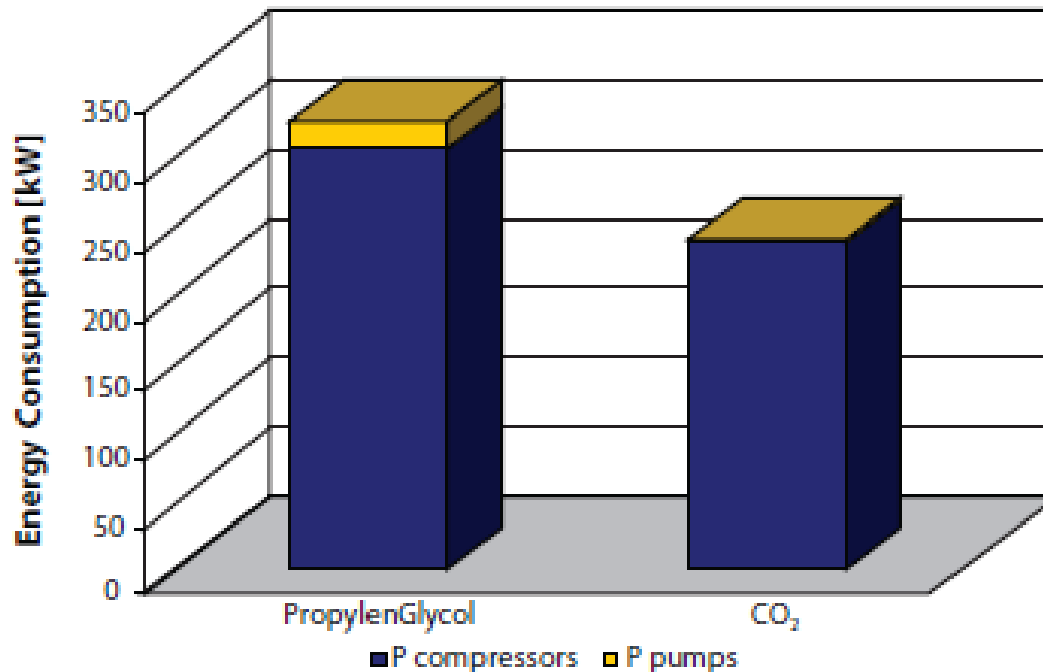


NH₃/CO₂ vs. NH₃/Glycol

Energy consumption comparison

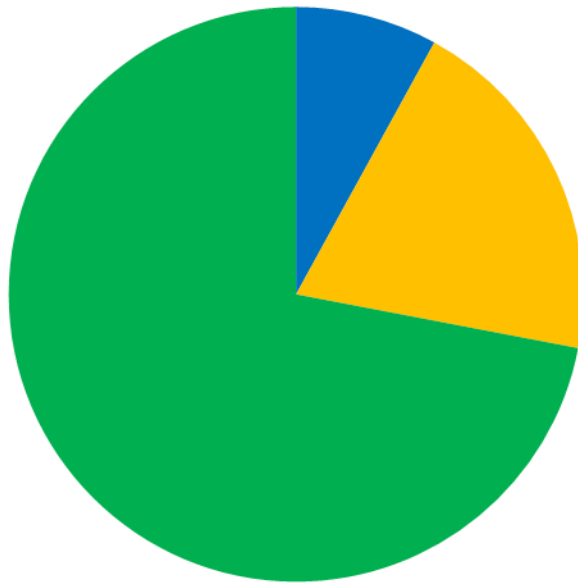
500 kW at 0°C room temperature

Potential energy savings: up to 20%

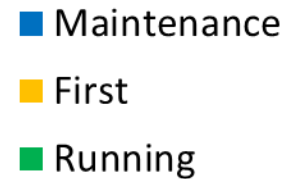
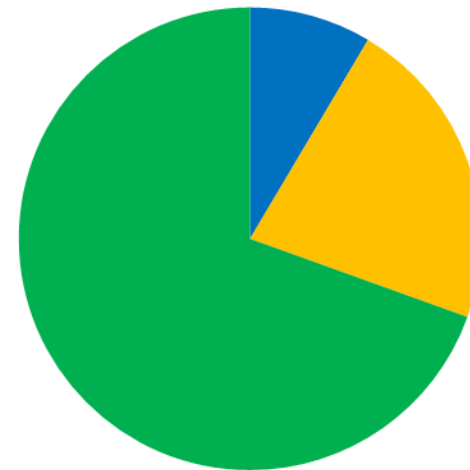


Cost Comparison - Glycol vs. CO₂

Glycol Plant



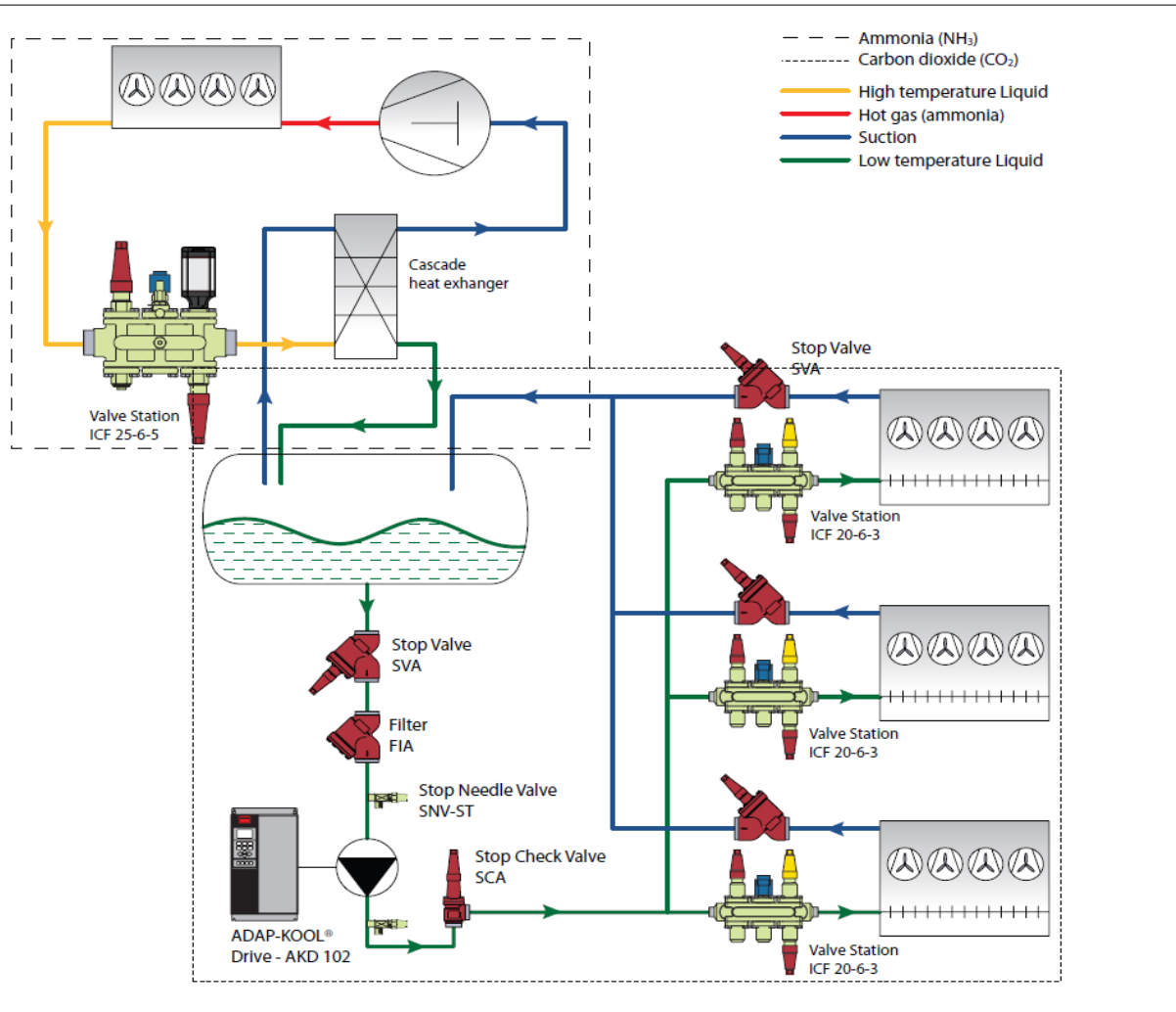
CO₂ Plant



20% approximate total savings

All 3 expenses reduced, with most significant reductions to running costs

Simplicity & Reliability



The ammonia charge is relatively small and restricted to the engine room only

CO₂ pumped emphasizes simplicity, control, and maintenance of modern plants

NH₃/CO₂ components are readily available for 754 psig, making design and construction accessible to OEMs and contractors

Leading with Modern Refrigeration



Learning Experience:

- Wide range of room temperatures from one CO₂ temperature loop
- Faster pull downs
- Limited ammonia charge
- Easy startup – within 48 hours



Formula for Repeated Success



First-hand Experiences & Lessons Learned:

- Supplier's help and support was crucial
- Project must be scalable and repeatable
- Integrated approach, including heat reclaim
 - Measurable results

Four additional projects launched:

- Canadawide Phase 2 - within 6 months
- Large 1000 TR cold storage for fruit & vegetables
- Smaller 150 TR for fruit & vegetables
- Large -45°F holding freezer with cold storage



ATMO
sphere
the Business Case

natural refrigerants

Thank you!