



North American pioneer
in CO2 cooling technologies using natural refrigerant

REFRIGERATED WAREHOUSE CASE STUDY

Location: Montreal

Phase 1: 2012 | Phase 2: 2017

"WITH CARNOT'S REFRIGERATION SYSTEM, WE HAVE TRIPLED THE VOLUME OF OUR WAREHOUSE AND MAINTAINED THE SAME LEVEL OF ENERGY CONSUMPTION."

Denis Pageau, Vice President of business development,
Michal Inc.

CHALLENGE

Implement an energy efficient refrigeration system

- Implementation of an energy efficient system in a new building (Phase 1)
- Incremental refrigeration needs (Expansion phase scheduled)
Offer a modular system to maximize efficiency

Year	2019	2024	2030	2036
Reduction Percentage (%)	10	35	70	85

Table: Canada HFC phasedown

Project Characteristics

Phase 1 (New Building)

- Storage of fruits and vegetables (32°F à 50°F)
- 86 600 square feet, 3,46M cubic feet
- 20 loading dock doors
- Storage Capacity of 861 palletes

Phase 2 (Building Expansion)

- Storage of fruits and vegetables (32°F à 50°F)
- Treatment Chamber (40°F)
- 56 500 square feet, 2,26M cubic feet
- 16 loading dock doors

SOLUTION

Phase 01 (New Building)

CARNOT Technology with a cascade CO₂/NH₃

- Dimensions / capacity: 196 TR@23F SST; 234 TR@32F SST
- Maintained temperatures between 32°F and 59°F
- 4000 hours in free-cooling mode
- Heat Recovery (for water and air heating)
- Refrigerant: More than 90% of charge is CO₂
- Hot gas defrost

Phase 02 (Building Expansion)

CARNOT Technology with transcritical CO₂ and parallel compression

- Dimensions / capacity: 200TR @ 23F SST
- Maintained temperatures between 32°F and 59°F
- Refrigerant: 100% CO₂
- Hot Gas Defrost





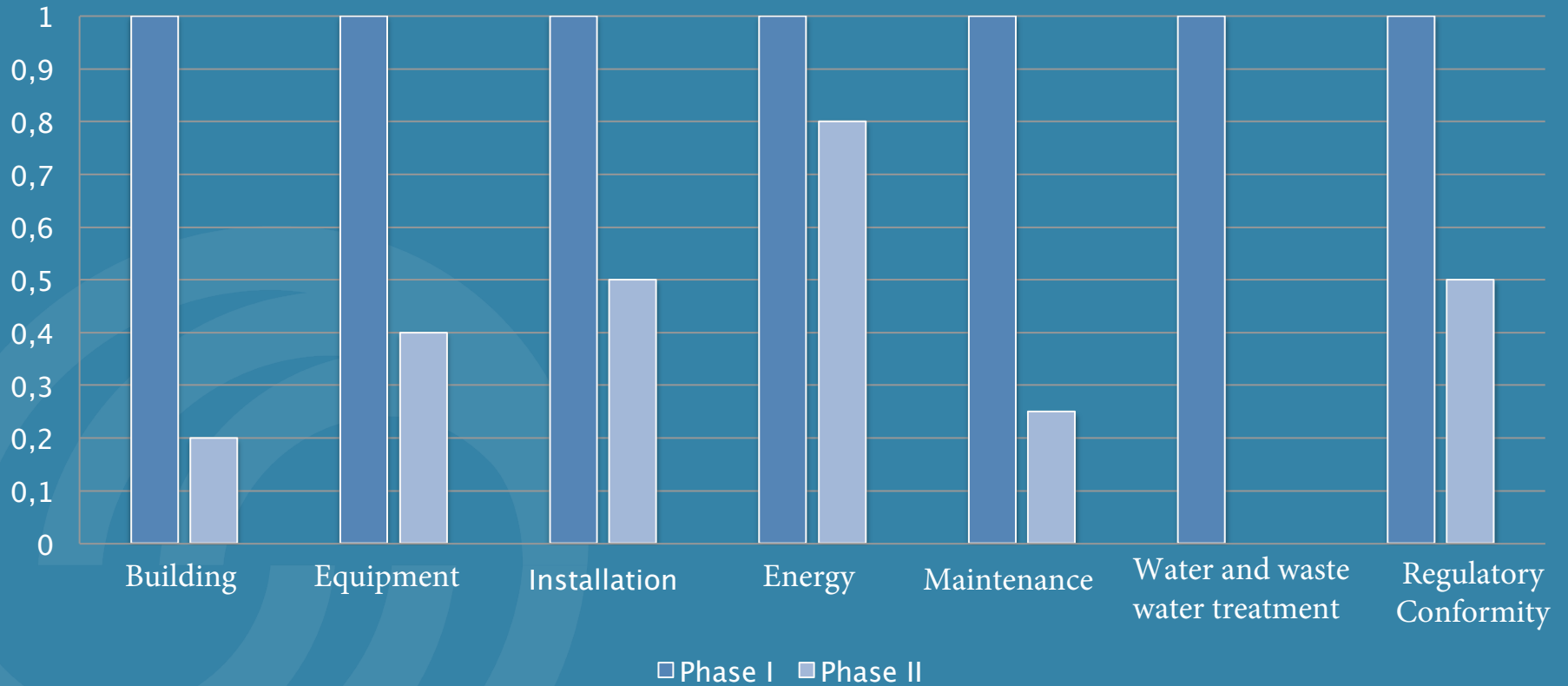
RESULTS / ADVANTAGES

The installation of Carnot's Technology generated 6 major advantages:

- 01 Removal of all future needs for refrigerant conversion due to the phase out of synthetic refrigerants
- 02 Coefficient of performance (COP) significantly higher (14.7 for phase 1, 18.1 for phase 2)
- 03 Extended preservation of the food products
- 04 Reduction of energy costs, maintenance costs and of costs related to refrigerants (Compared to a standard technology)
- 05 Faster and higher return on investment.
- 06 Mechanical room reduction of 80% compared to the installation of a conventional system

RESULTS / ADVANTAGES

Phase I versus Phase II





CARNOT

REFRIGERATION

North American pioneer
in CO2 cooling technologies using natural refrigerant

www.carnotrefrigeration.com

ventes@carnotrefrigeration.com
+1-819-376-5958

3368 Bellefeuille
Trois-Rivieres
Quebec, Canada
G9A 3Z3