



# Retrofit of an existing R22 refrigeration system with CO<sub>2</sub> in a large supermarket (1600000 Btu/h)

*The true numbers*

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For several supermarket chains around the world, the decision of using transcritical Co2 refrigeration systems in there new stores was done in the past and they are now enjoying the benefits of this decision.

The retrofit of an existing sites is a more challenging decision.

This presentation will talk about one of our retrofit projects. This project is a relooking and refrigeration system replacement only. Same location, same footprint and pretty similar numbers of display cases... here comes... **THE TRUE NUMBERS...**

## Questions to answer:

How easy it is to simply retrofit with CO<sub>2</sub> refrigeration systems?

Is it energy wise?

How much does it cost?

## How easy it is to simply retrofit with CO2 refrigeration system?

The answer is; not easy...How easy it is to replace any refrigeration system in an open store without stopping the operation???

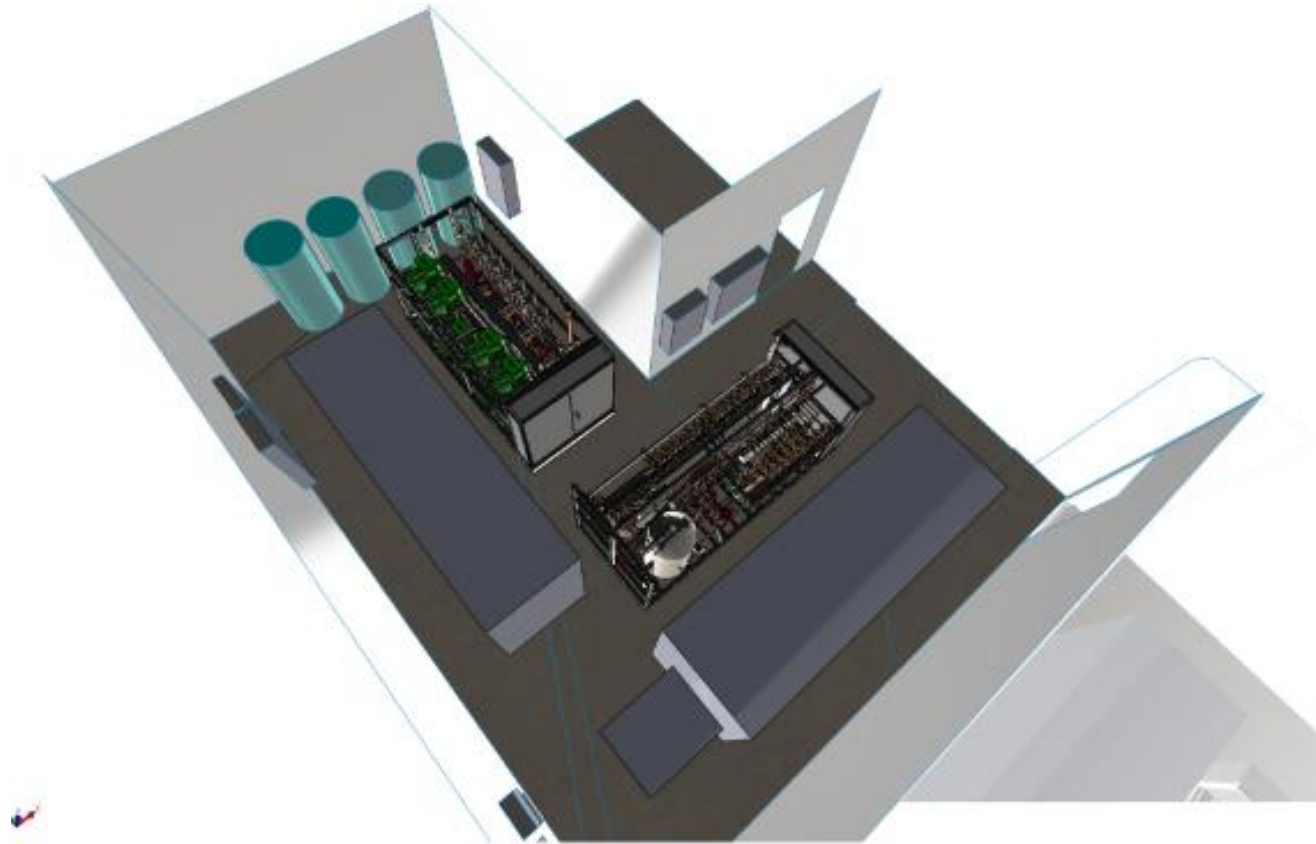
	BEFORE	AFTER
Total supermarket area	44607 ft <sup>2</sup>	44607 ft <sup>2</sup>
Sales area	32343 ft <sup>2</sup>	32343 ft <sup>2</sup>
MT Display cases	86/950 kbtu/h	94/1006 kbtu/h
LT Display cases	34/240 kbtu/h	86/283 kbtu/h
MT DEFROST	HG	APD
LT DEFROST	HG	HG
HEAT RECLAIM	1 795 000 Btuh	

# How easy it is to simply retrofit with CO2 refrigeration system?

2011



## How easy it is to simply retrofit with CO2 refrigeration system?

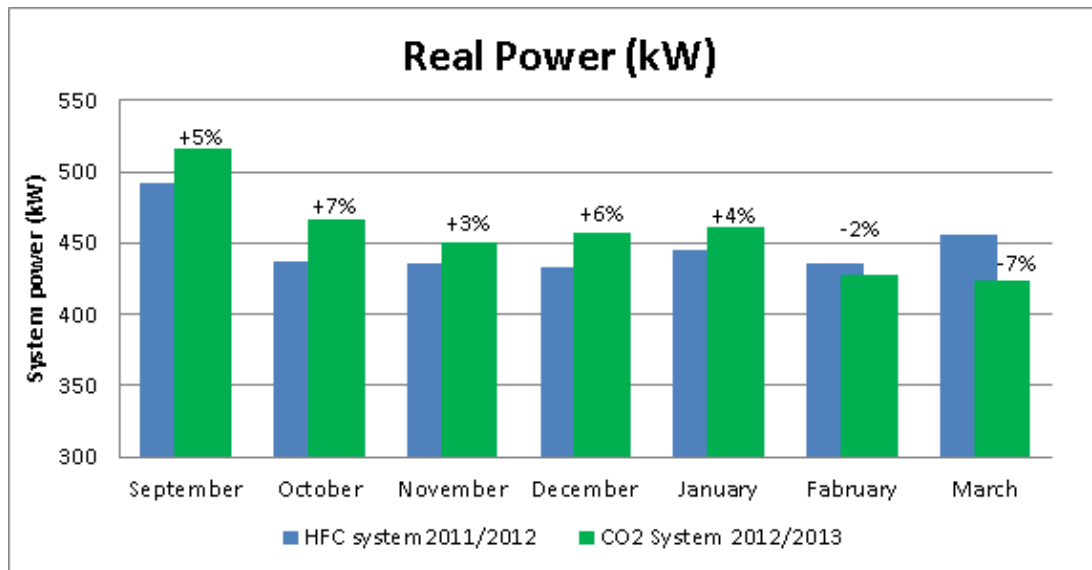
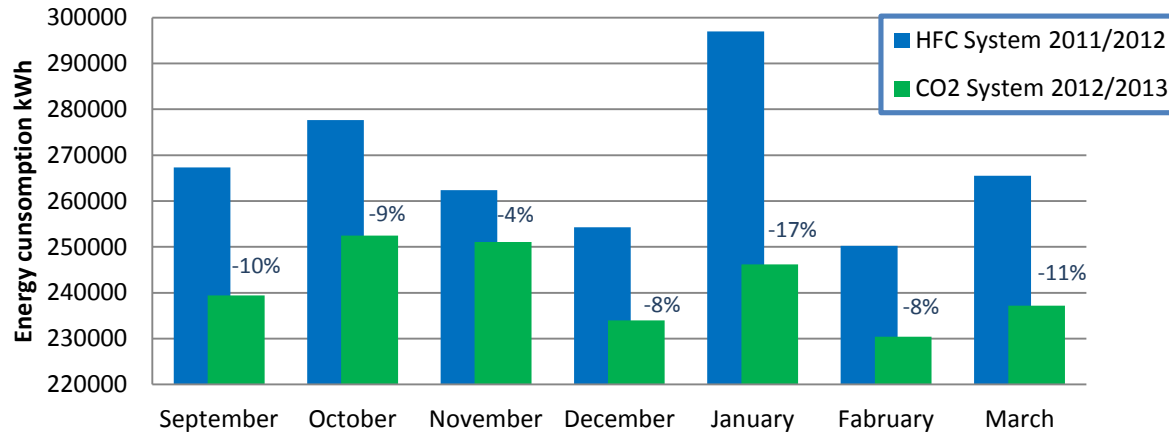


## How easy it is to simply retrofit with CO2 refrigeration system?

2012



## Is it energy wise? The answer is; Yes











## How much does it cost?

- There is no one size fits for all !
- Cost will depend of the planning with the operation team
- How many phases (days or nights work)
- Engineered solution will have a huge impact on the cost
- Skill of labor is key

# Total Cost of Ownership Analysis Over 10 yrs






all numbers are for indication purpose only

**MINOR RENOVATION**  
 1st cost: 400,000 \$

- Maintenance costs 
- Cost of gaz 
- Energy consumption 
- No Subsidies 
- Food preservation 
- Expenses of equipment replacements only postponed 

Total cost of ownership :  
 1,400,000 \$

**MAJOR RENOVATION**  
 1st cost: 900,000 \$

- Maintenance costs are predictable 
- Energy consumption 
- Subsidies 
- Improvement of food preservation 
- 20 years life expectancy 

Total cost of ownership :  
 1,100,000 \$



Thank you!