



ATMO
sphere

foodstuffs NORTH ISLAND



Our experience with CO₂

Foodstuffs North Island Limited



What Initiated the Change?

- *Introduction of the Emission Trading Scheme (ETS) in 2002 and its impact on high GWP refrigerants*
 - *Our refrigerant usage at the time was solely focused on R404a/ R507*
 - *Indications were that carbon emission tax would be in the vicinity of NZ\$25/ tonne - this meant 1kg of R404a had the potential to increase in cost by approx. \$100*
- *The proposed phase down of high GWP refrigerants in Europe*
 - *Concerns about the effect of the phase down on availability of R404a/ R507 for the New Zealand market*
- *Consideration of what a long-term solution, given what we expected to be available, could be?*
 - *At the time there were no viable synthetic refrigerants to consider, as most of the refrigerants had a level of GWP*

- *Based on the progress made by manufacturers, suppliers and installers in Europe, it appeared to be a viable long-term solution.*
- *Information supplied to us by our refrigeration installers indicated that there would be 10% power consumption reduction when comparing a R404a to CO₂ system.*
- *Our refrigeration consultant calculated that through the 20 year life cycle of the a refrigeration system there would be a \$1m saving by using CO₂ as an alternative to R404a.*

What have we done?

- *Our initial installations were based around sub-critical CO₂*
- *Introduction of fully trans critical CO₂ systems in 2012*
- *We now have:*
 - *7 medium format stores that are trans critical CO₂ and 5 that are sub-critical CO₂*
 - *12 large format stores that operate with CO₂, where 2 are pumped CO₂ and 1 is sub-critical*

Recent Stores

#4

Milford New World.

Refrigeration Load
Low Temperature 20Kw
Medium Temperature 215Kw



#5



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SAVER
NZ PREPACK
BABY FLAT
MUSHROOMS
250GM PACK
4.49
EA

SAVER
NZ LOOSE
RED/ ORANGE
MUSHROOMS
2.99
EA

SAVER
4.49

BAKER

100%

Recent Stores

#6

Te Kuiti New World.

Refrigeration Load
Low Temperature 20Kw
Medium Temperature 190Kw



Pickles / Oils
Canned fish
Canned vegetables
Cooking sauces
Ready meals
Pasta / Rice

5

Muesli bars
Flour / Sugar
Baking needs
Soft drinks
Water
Plasticware

4

Confectionery
Chocolates
Biscuits
Kitchenware
Gluten free

3

Tea / Coffee
Juice / Smoothies
Canned Fruit

2

Deli
KAI KAKARA

Seafood
KAI KAKARA

Bakery
KAI KAKARA

10⁹⁹
13⁹⁹

FREE EXIT

NO TIME TO BAKE?
WE'LL DELIVER
ANY OF OUR DELI
PRODUCTS

9⁹⁹
11⁹⁹

LITTLE GARDEN
FENNEL

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Recent Stores

#8

Tauriko Pak n Save.

Refrigeration Load

Low Temperature 60Kw

Medium Temperature 370Kw

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BUTCHERY

SEAFOOD



EXTRA LOW
NZ WHOLE BEEF BOLAR ROAST
14.99 PER KG
YOUR EYES AREN'T PLAYING TRICKS

EXTRA LOW
NZ WHOLE BEEF BOLAR ROAST
1.99 EACH

Recent Stores

#10

Papakura New World.

- Refrigeration Load
- Low Temperature 25Kw
- Medium Temperature 215Kw





Seafood
IN-STORE FISHMONGER

Butchery

Express
Checkouts

Self
Checkouts

15.99

STORE SAVER
Capsicums
1.49 ea

Club Deal
Lettuce Fresh Cut
1.99 ea

What have we found?

- *It's important, when undertaking refurbishments, either to fully replace the refrigerated cabinet, or, at a minimum, to replace the cabinet's evaporator*
- *When installing refrigeration into a new build, the cost of CO₂ plant has now reached a point where it is almost cost neutral in comparison to a synthetic system*
- *There is a cost premium when installing CO₂ systems into existing stores, mainly due to new pipework having to be installed. However, this is off-set by the efficiencies and low running cost of CO₂ in comparison with synthetic refrigerants*

Where are we going?

- *Historically we've used the waste heat from the CO₂ systems we've installed to supplement our hot water heating: below are some examples of our initiatives:*
 - *More effective ways of heating the building with the waste heat.*
 - *Using waste heat to supply all hot water requirements in the store*
 - *On larger installations, using the waste heat for underfloor heating, where traditionally electric heaters were used, i.e. to stop ice heave in freezer room floors*
- *Investigating how we could use natural refrigerants in our retail space air-conditioning systems*

What are our concerns?

- *There is a perception, when using CO₂, that it is more dangerous to public health, because of the Health & Safety considerations that have to be taken into account regarding CO₂ usage, compared with synthetic refrigerant usage. An example of this is: requirement to have leak detectors in the retail space and also in back of house refrigerated spaces. One could argue that the same level of risk applies to synthetic refrigerant use*
- *Education is an important element to increase the levels of understanding regarding this type of refrigerant*

Thankyou very much!

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