



High Efficiency Store Designs Using Natural Refrigerants

Food Retail Panel

KEITH MILLIGAN

JTM Corporation

Piggly Wiggly

Piggly Wiggly - America's First Self Service Grocery

Over 600 Stores in
17 States

Piggly Wiggly® founded in 1916 was **FIRST** to...

- Provide checkout stands and price mark every item in the store
- Use refrigerated cases to keep produce fresher longer
- Put employees in uniforms for cleaner & more sanitary food handling
- Franchise independent grocers to operate under the self-service method of food merchandising

JTM Corporation founded in 1966 :

- Third generation family business
- 19 stores and 9 neighborhood shopping centers
- Serving in and around Columbus, GA



Down Home, Down The Street

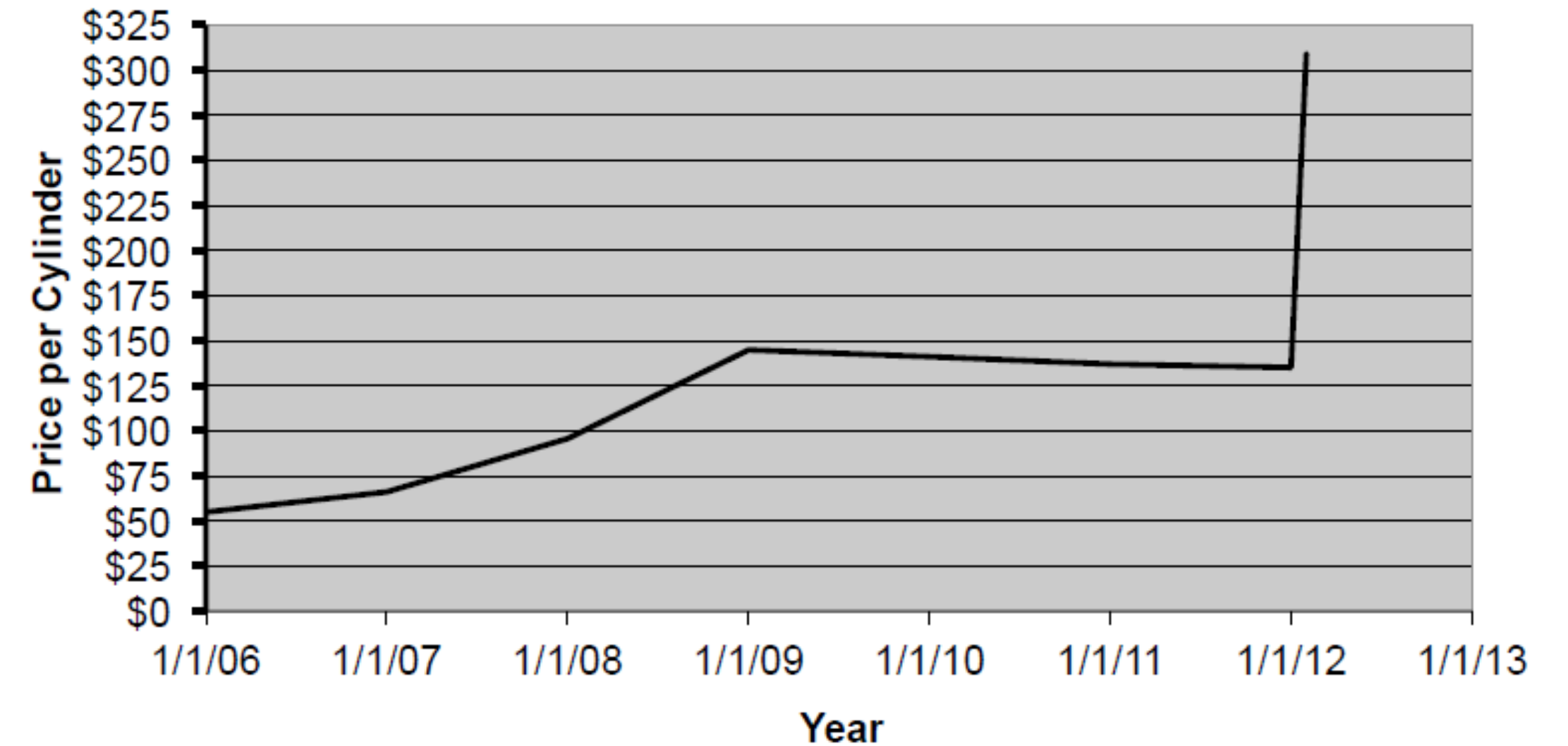


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- Change in competitive landscape
 - ⌘ Small format stores
- Razor thin margins for grocery business
 - ⌘ Need to reduce operating cost
- Anticipating regulatory pressures
 - ⌘ Ban of high GWP refrigerants by EPA SNAP and continuing actions
 - ⌘ GWP limit of 150 proposed by California Air Resources Board
- Increasing cost of synthetic refrigerants
 - ⌘ R-22 price increase from \$50 to \$300 per cylinder

Drivers for High Efficiency Store Design

Historical R-22 Price Sell Chart



Source : www.Refrigerant22.com



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Use of Natural Refrigerants

- NH₃ and CO₂ (GWP 1)

Reduced Refrigeration Energy

- High efficiency NH₃/CO₂ cascade refrigeration system
- Evaporative condenser, Heat Reclaim
- High efficiency display cases
- Doors on open display / Night curtains

Reduced Lighting Energy

- LED Store lighting
- Reduced lighting power density and skylights
- Occupancy and daylight controls

Reduced HVAC Energy

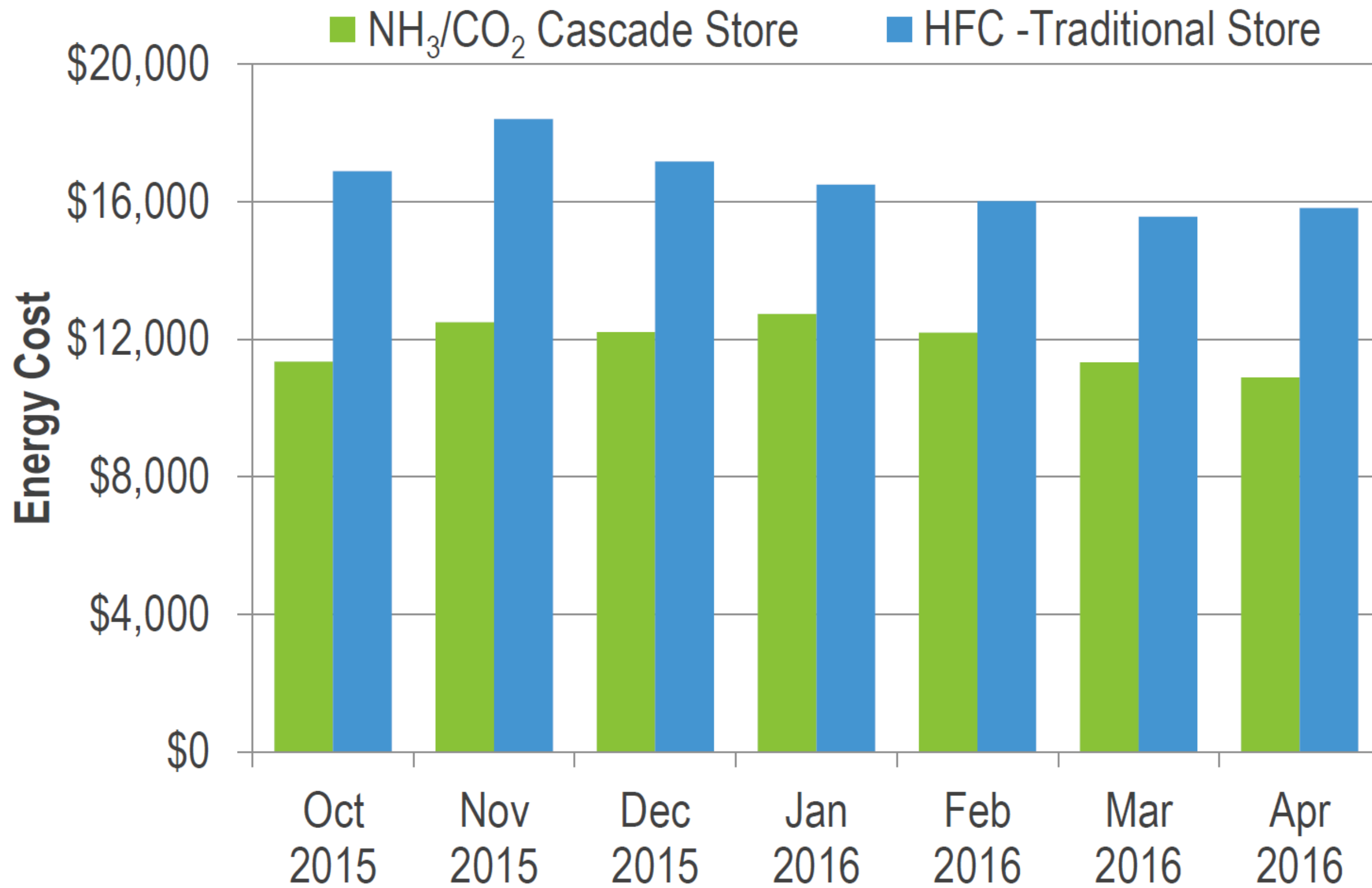
- High-efficiency Lennox rooftop units
- External Dryvit insulation and white roof (reduced gains)

Selected Design Features of High Efficiency Store



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Actual Data from Energy Bills*



Customer Name
J T M CORPORATION

Store Level Energy Savings Achieved

Cumulative Savings to Date
\$33,170
 Projected Annual Energy Savings
\$55,000-65,000

CUMULATIVE ENERGY SAVINGS
28.5 %

Prestigious EPA Greenchill Platinum Award (Tenth store in USA)



*Traditional HFC store data normalized for store size

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Challenges

- Premium on first cost of alternative systems
- Lack of incentives for use of natural refrigerants
- Training needs for installation contractor
- Lack of availability of skilled technicians for service

Benefits

- High energy savings
- Reduced environmental impact
- Low cost of natural refrigerants
- No regulatory concerns due to low charge of ammonia
- Improved product shelf life



ATMO
sphere
business case
natural refrigerants

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Thank you very much!