



Data Technology to Reduce Supermarket Refrigeration Leak Rates

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Today's Host



Kersey Manlicic, Doctor of Philosophy (PhD)

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Kersey has worked in various sectors before coming to the U.S. Environmental Protection Agency (EPA). Most recently, he worked for 3.5 years at the California Air Resources Board implementing an incentive program for cleaner agricultural equipment and ensuring that Cap-and-Trade incentive programs benefitted disadvantaged communities. Prior to that, he worked with state agencies to plan hydrogen fueling infrastructure for fuel cell electric vehicles. He holds a Bachelor of Science (BS) in Mechanical Engineering, a BS in Materials Science & Engineering, a Masters of Science (MS), and a PhD in Environmental Engineering, all from the University of California, Irvine.

Questions and Webinar Feedback

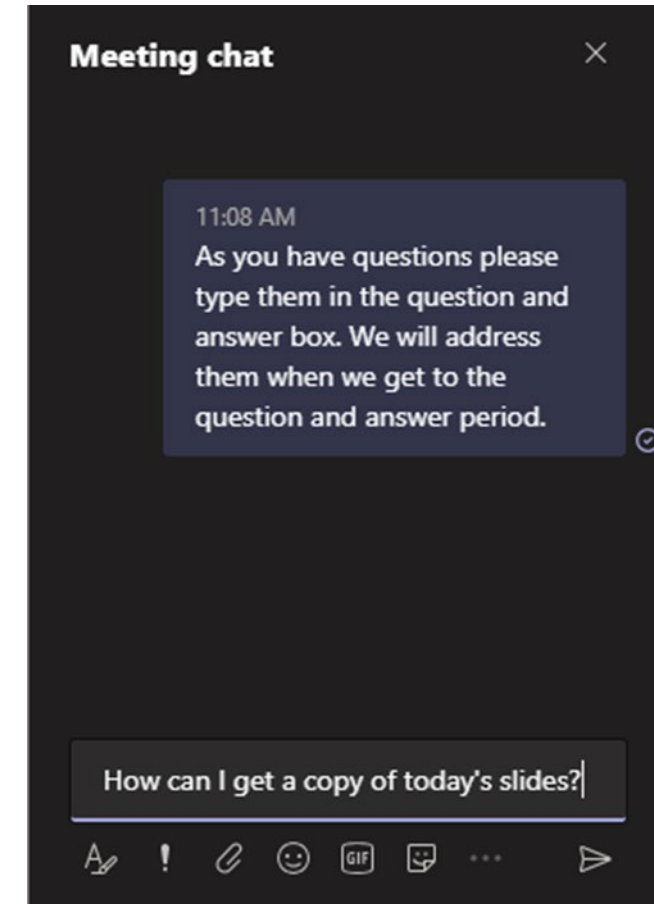


Question and Answer Session

- Participants are muted
- Questions will be moderated at the end
- To ask a question, enter your comment into the chat box

Feedback Form

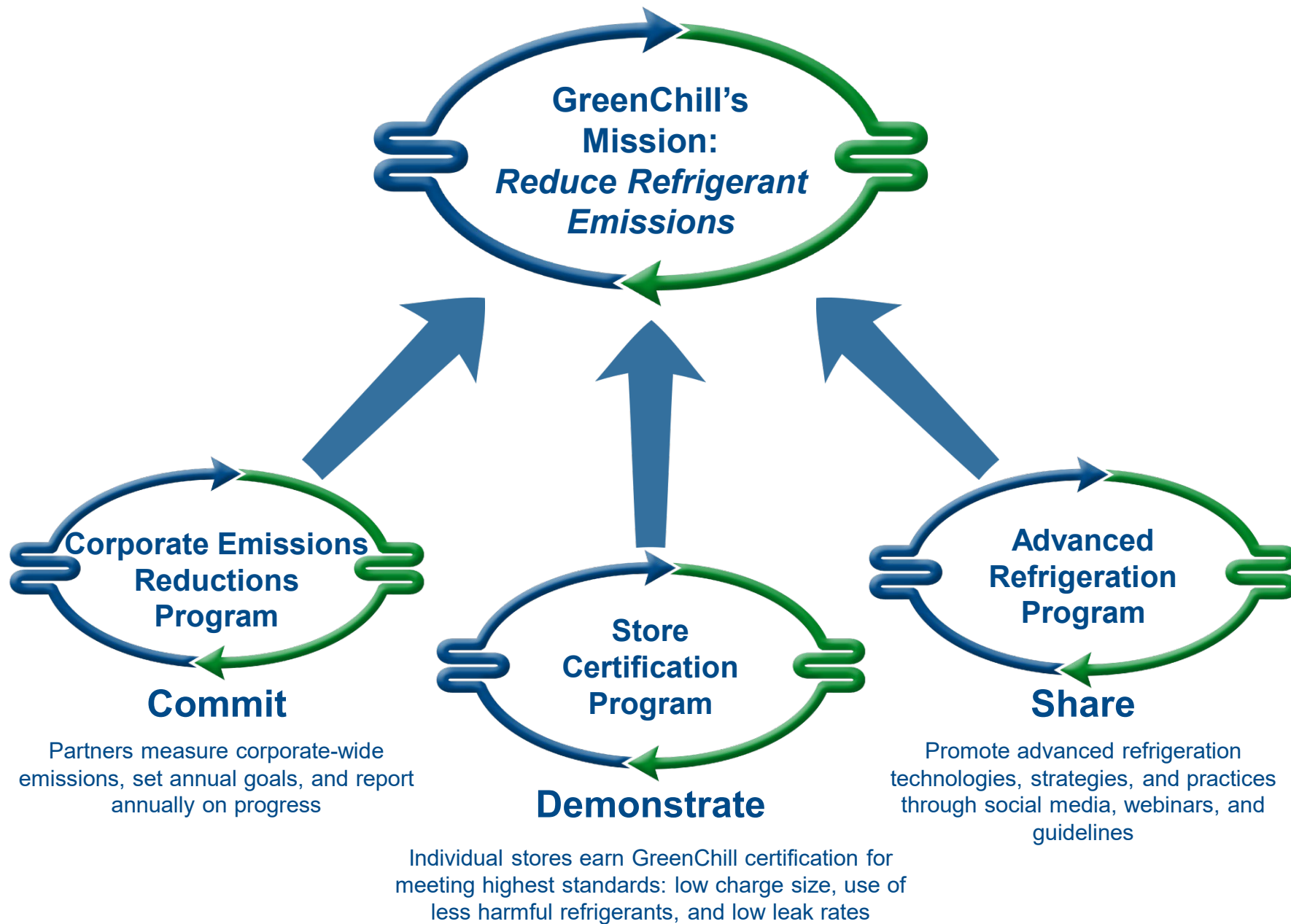
- We value your input!
- The link to a feedback form will appear in the chat window





Recording and Slides

- Webinar is being recorded
- Materials will be posted on the GreenChill website under Events and Webinars: www.epa.gov/greenchill
- To receive notification when materials are posted email: EPA-GreenChill@abtassoc.com



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Upcoming GreenChill Webinars



- **May 3: Advancements in Flammable and Next Generation Refrigerants**
 - Presenters from Chemours will discuss advancements in flammable and next generation refrigerants.
- **June 21: Solutions to Meeting Food Retailer Equipment Specifications**
 - Presenters from the North American Sustainable Refrigeration Council will present on food retail refrigeration leaks: exploring the true cost and equipment specification solutions.
- All GreenChill webinars are at 2-3 PM Eastern
- To be added to our webinar invitation list, email EPA-GreenChill@abtassoc.com



Today's Speakers...

Clay Rohrer



Clay Rohrer

Director Connected Solutions

Hussmann Corporation

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Clay has worked for 23 years in the Refrigeration Industry, 14 years with Hussmann, in a variety of roles in engineering, innovation, and business management. Most recently, Clay has focused his career on transforming the refrigeration business from emergency break fix to a data driven performance based approach.

Nathan Hevesy



Nathan Hevesy

Commercial Director, Retail Services Technology

Hussmann Corporation

Phone: 678-480-8902

Email: nathan.hevesy@hussmann.com



Nathan has worked for more than 15 years at Hussmann in a variety of roles including program and project management, branch operations leadership and currently as Director commercializing Hussmann's cloud based predictive analytics solution. He has a strong belief in our vision of a 5% industry refrigerant leak rate and the idea that actions drive behaviors. He began his career with Ingersoll Rand and has a BS in Industrial Engineering from Purdue University and a Master of Business Administration (MBA) from Georgia Tech.

Daniel Byerley



Dan Byerley

Product Manager, Retail Services Technology

Hussmann Corporation

Phone: 484-889-8124

Email: daniel.byerley@hussmann.com



Dan has worked for 6 years with Hussmann, serving in project and product management roles. Throughout his career, he has extensive experience in providing a data-first approach and in challenging the status quo of traditional business operations. He holds a BS in Mechanical Engineering from Clemson University.



Data Technology to Reduce Supermarket Refrigeration Leak Rates



\$627,060

\$627,060

Same margin
dollars as \$16.5M
in sales for the
average grocery
store.



\$627,060

Annual maintenance budget for a dozen mid-size grocery stores.



A photograph of two men in a factory setting. Both are wearing safety glasses and dark work shirts. The man on the right has a beard and is smiling broadly, looking towards the left. The man on the left is bald and also smiling, looking towards the camera. The background is a blurred industrial environment with overhead lights.

\$627,060

Employing 5-6 technicians annually.



\$627,060

The 2-year refrigerant material cost savings

21-store regional retailer

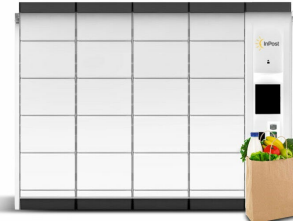
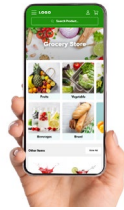
Predictive analytics on their refrigeration system





Retail Grocery Priority Drivers

Retail Growth



Below the Surface

There are pressures threatening retail

- Rising input costs (energy, materials)
- Skilled labor scarcity driving wages higher and quality lower
- Rise of environmental, social, and governance (ESG) responsibilities



Consider the Future

Backroom operations will become essential to sustain high revenue growth



What has happened to refrigerant?

25%

Average leak rate of U.S. supermarkets

>200%

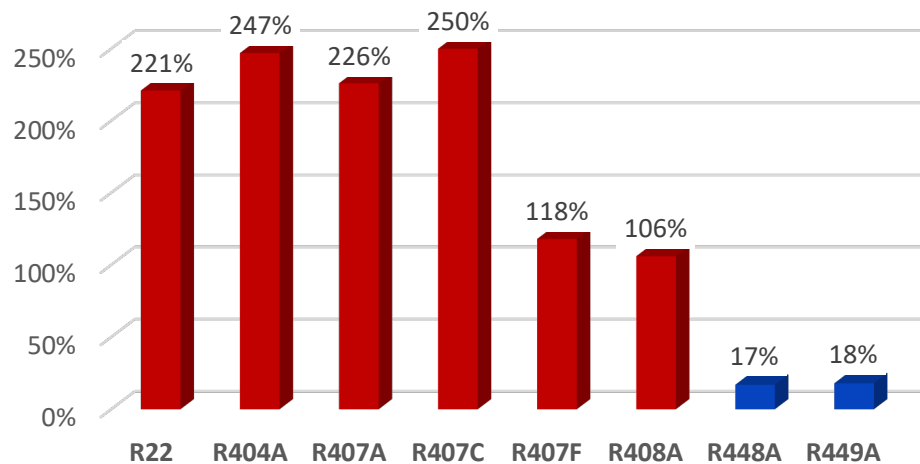
Price increase, weighted average for usage, for refrigerant in 2021 vs. 2020

128lbs

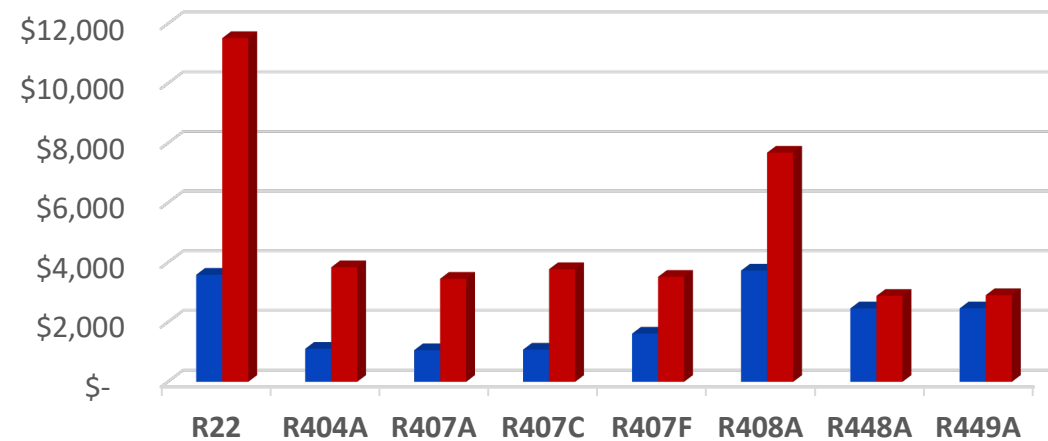
Average pounds (lbs.), per leak event, for large national grocers (2021 Hussmann serviced customers)

Refrigerant phase outs and supply chain factors have resulted in record prices

Refrigerant inflation year-over-year 20' vs '21



Cost per average leak event (128 lbs.) year-over-year '20 vs. '21





What is happening with labor (and its effect on refrigerant leaks)?

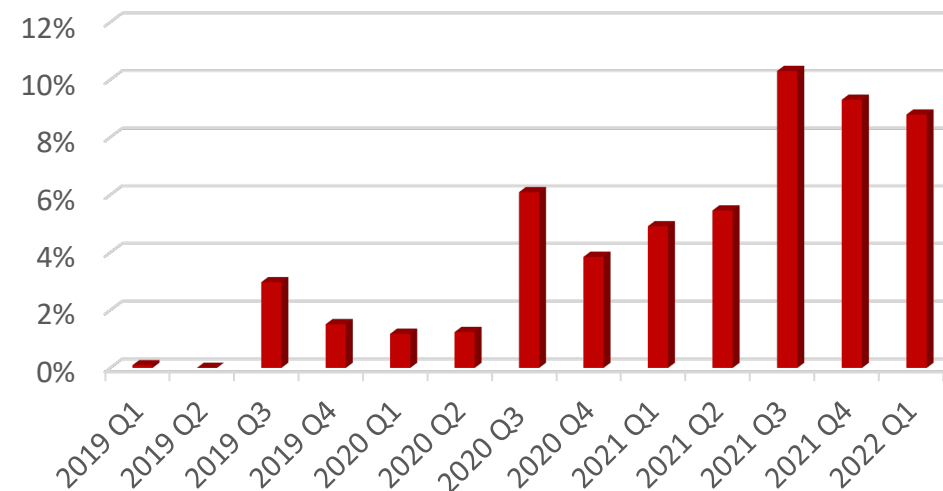
12.2hrs

Labor hours on work orders with refrigerant *(45% more than work orders without)*

60k

Estimated technician gap in the heating, ventilation, air conditioning and refrigeration (HVAC-R) Industry 2020

Technician wage increase from 2018 baseline



Wage increases have exploded in the post-COVID era
The industry technician gap continues to widen

Is labor a realistic solution to solve the refrigerant leak rate problem?



What are our companies facing in the future?

ESG PROMISES



MATERIAL INFLATION



LABOR SCARCITY



MARGIN SQUEEZE



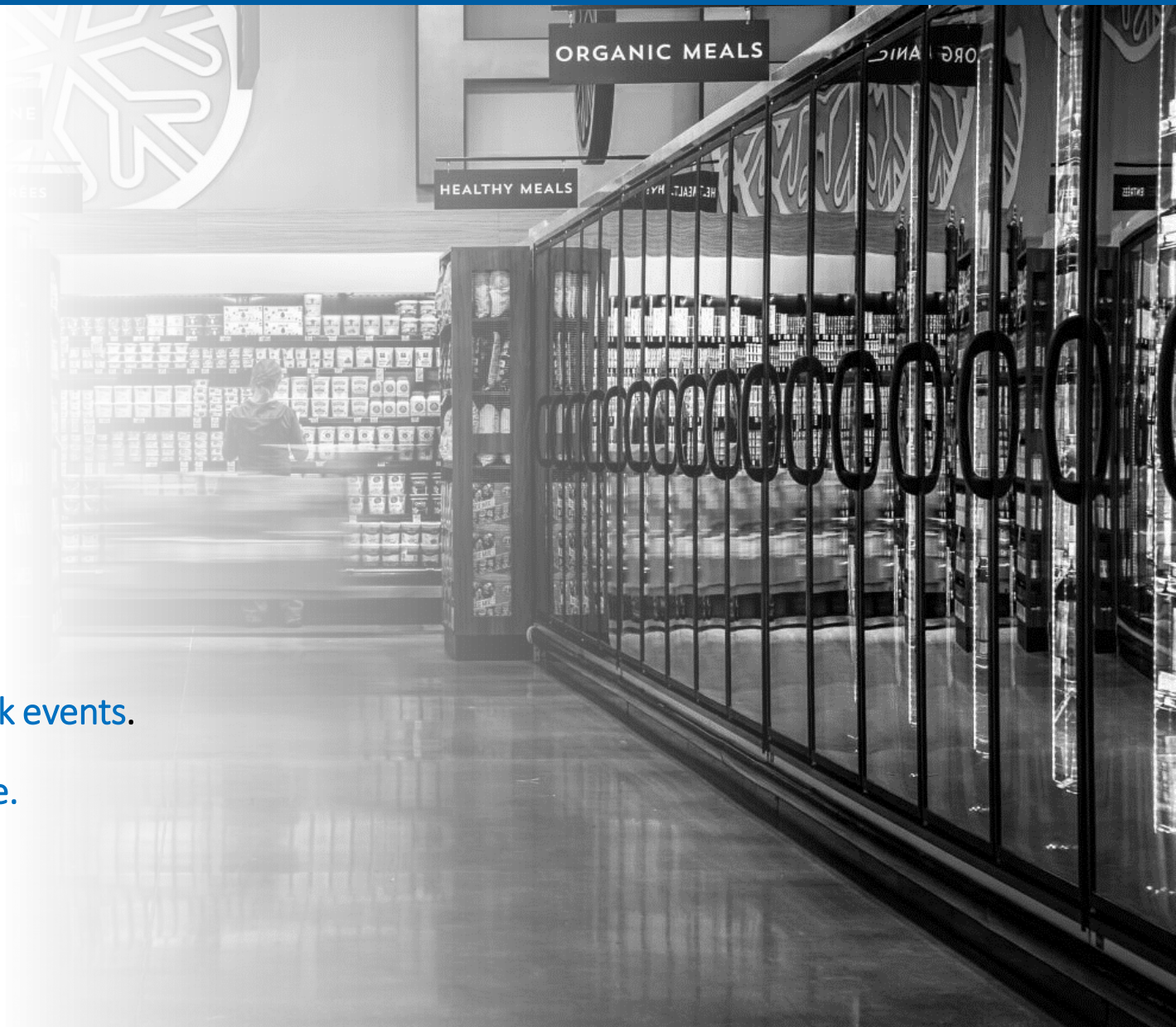
A 5% leak rate for our industry helps resolve these major market opportunities

How can software analytics be used to reduce leak rates?

Leak Detection and Predictive Analytics for Commercial Refrigeration

- 1 You have **assets**.
- 2 Assets generate **performance data**.
- 3 Software analyzes and **enhances the data**.
- 4 Software generates **prioritized refrigerant leak events**.
- 5 Save money and **move towards a 5% leak rate**.

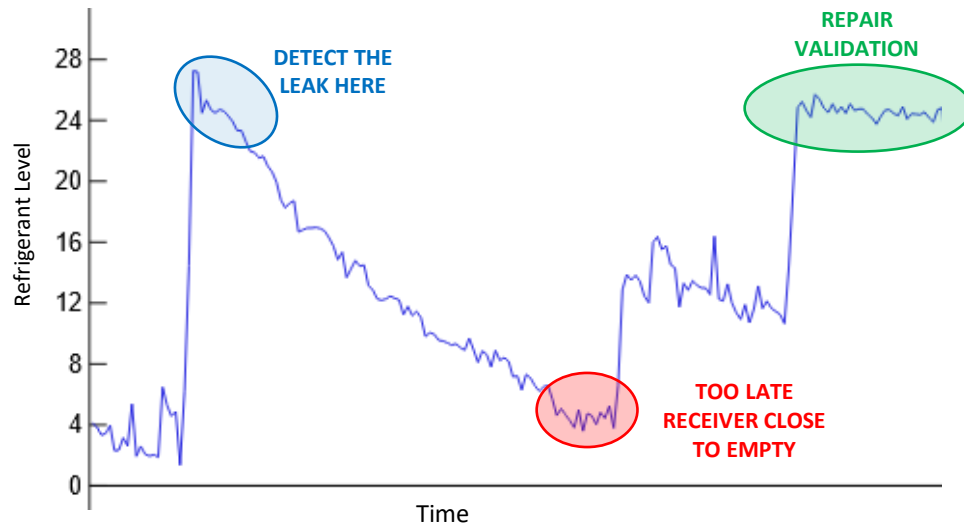
Simple | Automated | Effective





Analytics & Automation Driven Receiver Level Leak Detection

- “Always on” automated detection supplying leak rates and priority leaks for work orders
- Validation through trending ensures the right leak gets repaired



Features, Benefits, Advantages



Real Time Multi-layer Trending Algorithms

Result: Quicker detection, more accuracy, data driven leak management



Calculated Risks and Priority Levels

Impact: Prioritized work orders with known timelines



Leak Repair Validation 24/7/365

Impact: You know you found the “right” leak



Can Comply with California Air Resources Board (CARB) and Save you Money

Impact: Labor savings from waived leak inspections

Analytics and advanced refrigerant leak detection can save thousands of pounds of refrigerant from entering the atmosphere and can save thousands of dollars in costs for retailers and contractors.



Removing the “Saw Tooth Effect” from your Liquid Levels

Challenge

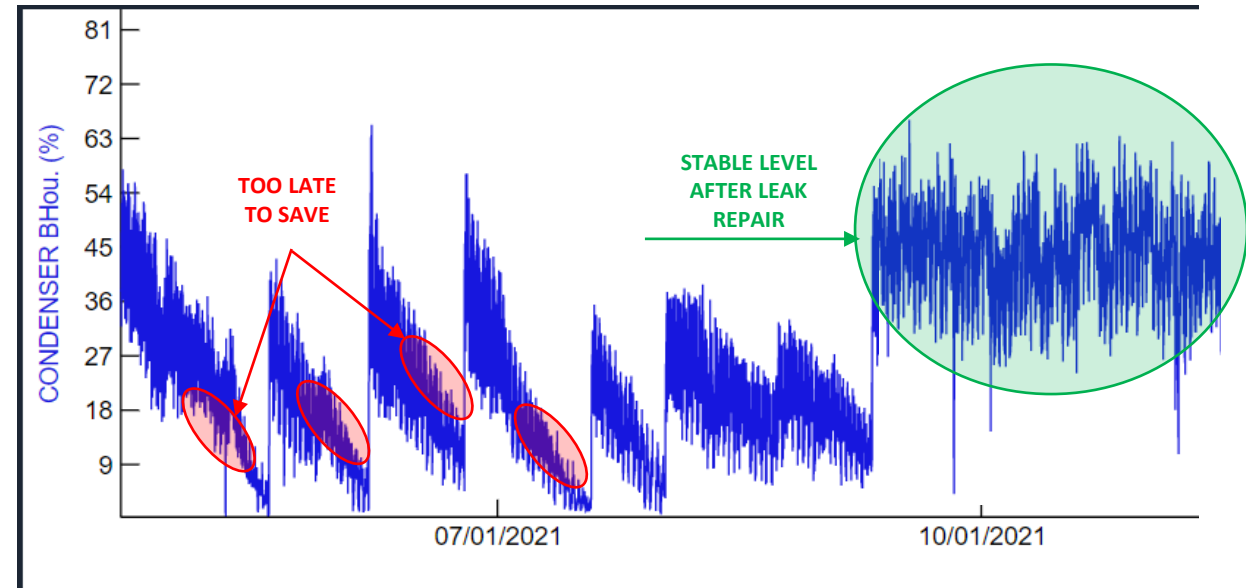
- This rack had a 600% annual leak rate which cost in excess of \$25,000 in replacement refrigerant

Tasks & Actions

- Utilize the technology to find the leaks at the peaks, not the valleys
- Provide prioritized, by leak rate, events to the right technicians

Analysis & Results

- Finding leaks early is one key part of the equation – Catch them at the peaks
- Post leak repair liquid level trending will verify if the “right” leak was fixed
- 24/7/365 event generation will catch the sawtooth effect



The Business Case

The return on investment is even more significant when you include the labor and material inflation to the savings tallied from leak repairs.



National retailer experiencing high leak rates in sites

Challenge

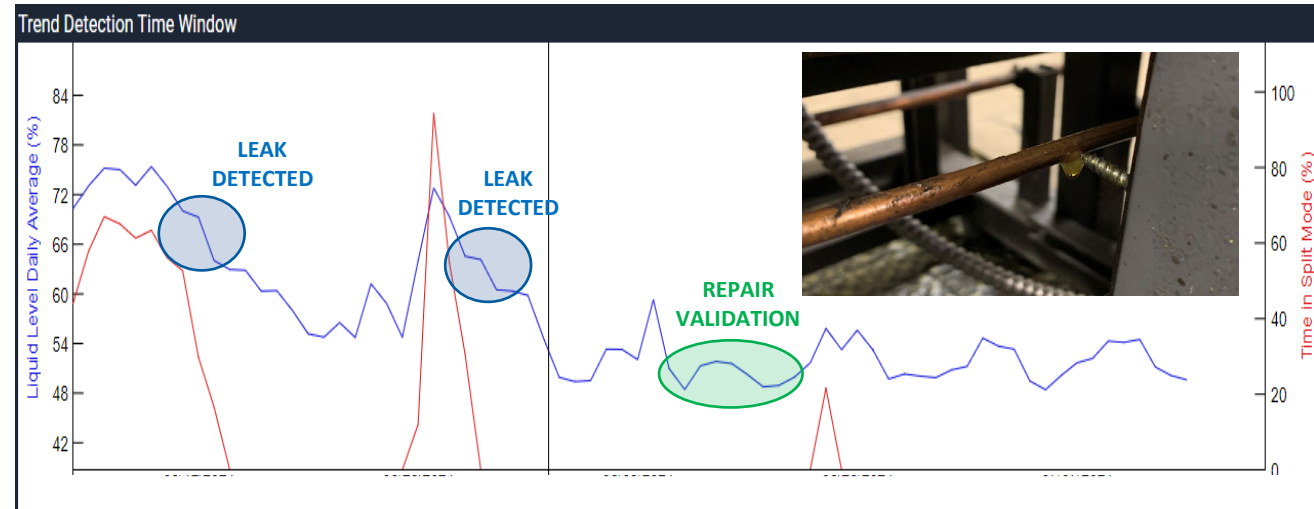
- Refrigerant leak controller alarms at 0-5% liquid level (critical)
- High refrigerant \$\$ loss, high labor costs to charge systems

Tasks & Actions

- Installed StoreConnect (SC) and setup advanced refrigerant leak detection.
- Setup rules of engagement with service provider to drive service events for leaks that are prioritized by leak rate and risk

Analysis & Results

- StoreConnect notified service organization well in advance to take corrective action
- Technician found leak and repaired at site
- 14 days later StoreConnect confirms technician fixed the right leak



The Business Case

A 30% leak rate reduction on average saves \$3,000 not counting labor. This leak resulted in greater than a \$6,500 savings with an return on investment with this technology in less than one year!



Case Study Results: Southeast regional retailer improvement in 21 store group

Actual Refrigerant Qty Used

	2019 Baseline	2020 SC Yr 1	2021 SC Yr 2
StoreConnect Sites (21)			
<i>RF Qty</i>	33,173	19,438	15,555
<i>RF Costs</i>	\$ 663,460	\$ 388,760	\$ 311,100
All Other Sites			
<i>RF Qty</i>	159,802	112,564	119,818
<i>RF Costs</i>	\$ 3,196,040	\$ 2,251,280	\$ 2,396,360

% Variances

Yr 1 vs. Baseline	Yr 2 vs. Baseline	2021 vs. 2020 Variance
StoreConnect Sites (21)		
-41%	-53%	-20%
-41%	-53%	-20%
All Other Sites		
-30%	-25%	6%
-30%	-25%	6%

**Cumulative 2 Yr Savings vs.
Baseline**

Lbs 31,353
\$ Savings \$ 627,060

lbs of Ref vs. no change
\$ Savings (not including inflation impact)

**StoreConnect
Adv. Leak Detection**

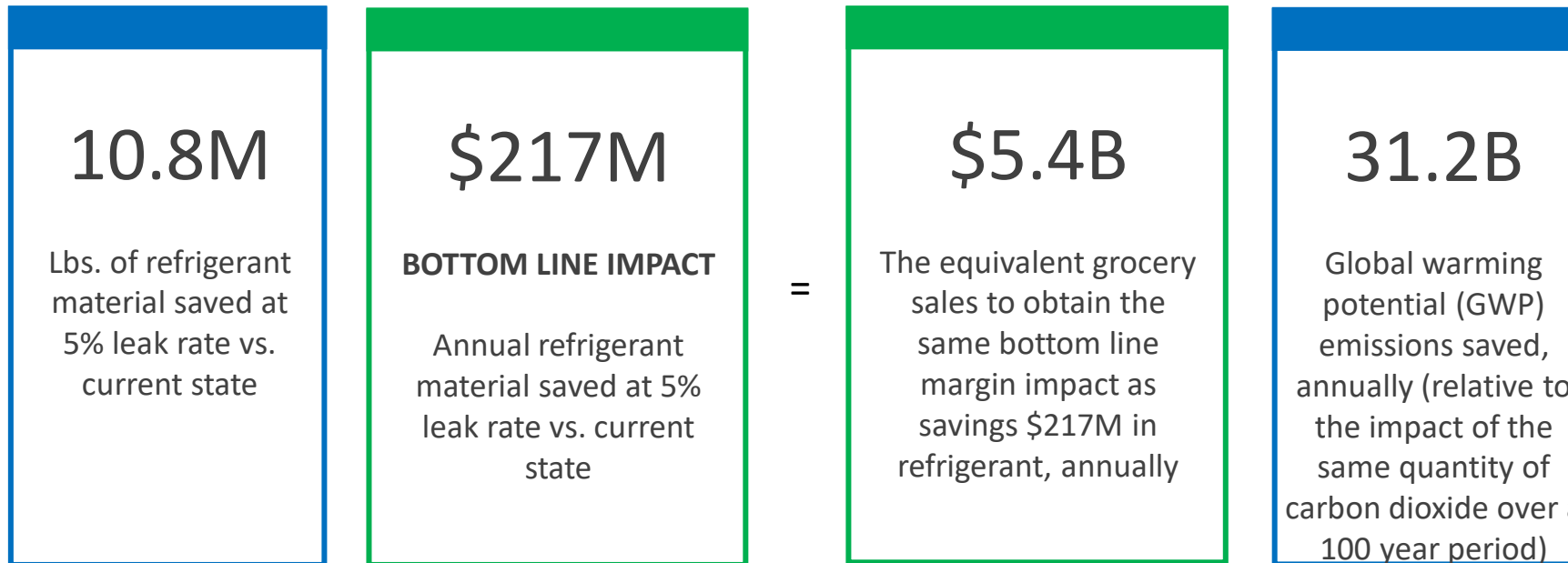
2 Yr Costs \$ 111,300
2 Yr Savings \$ 627,060

StoreConnect PRO - 21 Stores
Refrigerant Only (labor not included)



A Collective Vision for our Industry

What would a 5% leak rate mean for our industry?



Industry Wide 5% Leak Rates ARE Possible

Thank You!



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Contacts and Upcoming Webinars

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Upcoming Events

Date	Webinar Topic
5/3/2022	Advancements in Flammable and Next Generation Refrigerants
6/21/2022	Food Retail Refrigeration Leaks: Exploring the True Cost and Equipment Specification Solutions

Join our webinar invitation list or request today's slides: EPA-GreenChill@abtassoc.com

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