

HVAC Energy Efficiency for 2022 and Beyond



COOLcon 2022

Join us for an informative session on the revolutionary energy efficiency technology

COOLNOMIX®

HVAC Energy Efficiency for 2022 and Beyond



Dave Ableman
VP Operations, PROTEK

Your Hosts



Joe Mueller
CEO, CoolGreenPower



In
partnership
with



CoolGreenPower

Agenda

- Energy Efficiency for Commercial Buildings
- **COOLNOMIX** Compressor Controller
- Preventive Maintenance
- Break
- NYSERDA **COOLNOMIX** Demonstration Project
- **COOLNOMIX** Support
- Q&A

Key Takeaways

- **COOLNOMIX** combined with **Preventive Maintenance** = Great opportunity for both HVAC Contractors and Your Customers
- NYSERDA **COOLNOMIX** Demonstration Project budget provides full funding for HVAC Contractors and Customer costs
- HVAC Contractors will get to use the latest Bluetooth HVAC tools to perform their work on the NYSERDA **COOLNOMIX** demonstration project, learning new skills
- PROTEK and CoolGreenPower are available to support you with whatever you need to participate in this opportunity

Local Law 97 Overview

Local Law 97 Compliance Timeline (2019 - 2030)

Compliance Timeline:



Local Law 97 Limits & Penalties

Occupancy Group	Examples	2024-2029 (tCO2e/sf)	2030-2034 (tCO2e/sf)	2024-2029 (kgCO2e/sf)	2030-2034 (kgCO2e/sf)
A - Assembly	Theaters, Cafeterias	0.01074	0.00420	10.74	4.20
B - Business/Office	Offices, Banks, Outpatient Care	0.00846	0.00453	8.46	4.53
E & I-4 - Education	Schools, Academies	0.00758	0.00344	7.58	3.44
F - Factory	Factories & Assembly Plants	0.00574	0.00167	5.74	1.67
H, I-2, I-3 - High Hazard/Medical	Hospitals, Nursing Homes, Jails	0.02381	0.01193	23.81	11.93
I-1 - Institutional Care	Assisted Living, Rehab Centers	0.01138	0.00598	11.38	5.98
M - Mercantile	Retail Stores, Markets, Drug Stores	0.01181	0.00403	11.81	4.03
R-1 - Temporary Dwelling	Hotels	0.00987	0.00526	9.87	5.26
R-2 - Permanent Dwelling	Apartment Buildings	0.00675	0.00407	6.75	4.07
S & U - Storage/Utility	Storage Facilities, Tanks	0.00426	0.00110	4.26	1.10

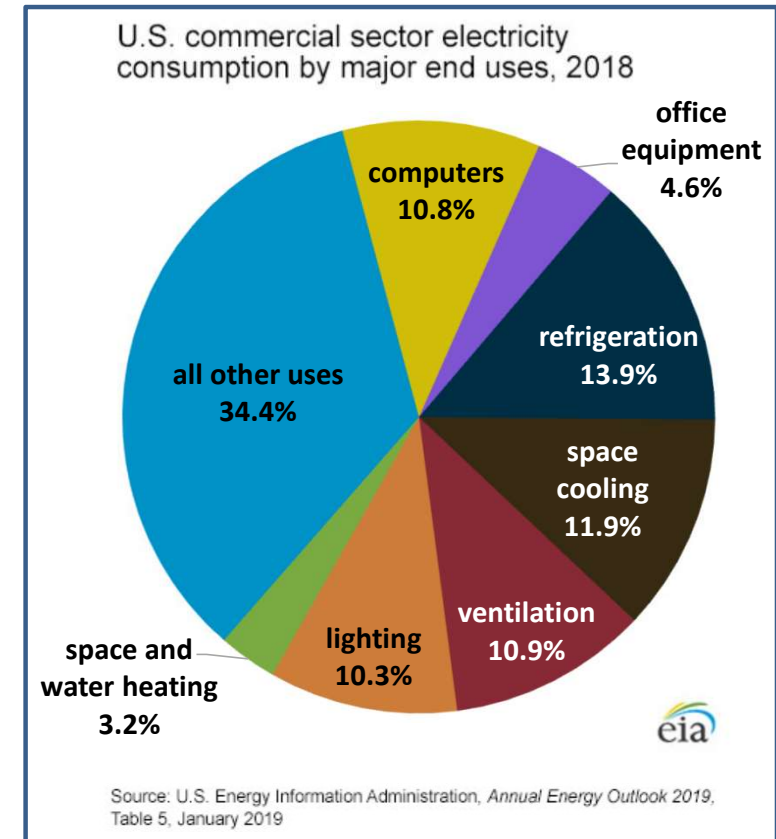
Office Building Examples	2024-2029	2030-2034	2024-2029	2030-2034
Square Feet	300,000	300,000	25,000	25,000
Electricity (kWh)	7,500,000	7,500,000	625,000	625,000
Current Electricity Emissions (t)	2,167	2,167	181	181
Therms of Natural Gas	80,000	80,000	6,667	6,667
Natural Gas (kBtu)	8,000,000	8,000,000	666,667	666,667
Current Natural Gas Emissions (t)	425	425	35	35
Total Emissions (t)	2,592	2,592	216	216
Class B Limit (kgCO2e/sf)	8.46	4.53	8.46	4.53
LL97 Limit (t)	2,538	1,359	212	113
Excess (tons)	54	1,233	5	103
Penalty Per Ton	\$268	\$268	\$268	\$268
Penalty Per Year	\$14,497	\$330,469	\$1,208	\$27,539

Energy Audit Report Penalties:

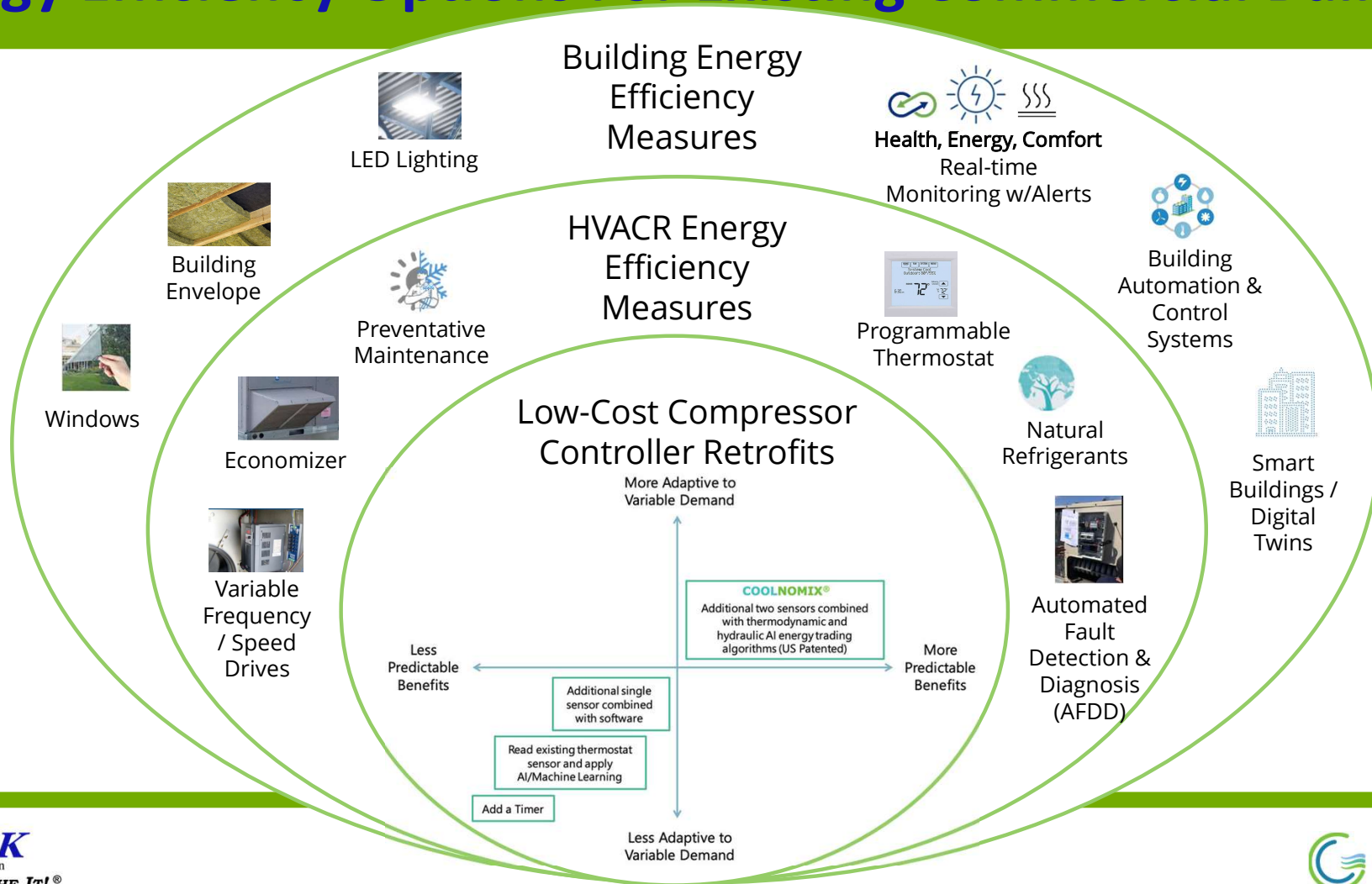
- **Missed report:** \$0.50/sf per month. E.g., a 300,000 SF building would pay **\$150,000 per month!**
- **False report:** **\$500,000** and up to 30 days of **imprisonment!**

Big Problems with Commercial Buildings & Energy

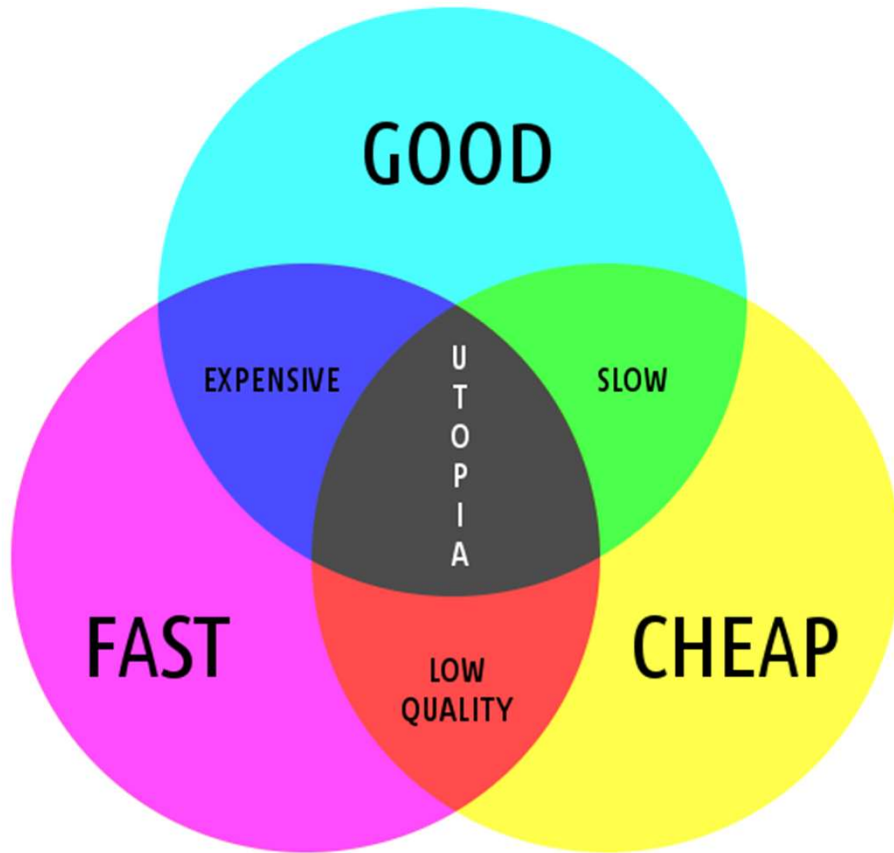
- In NY, **80%** are **NOT** energy efficient
- HVACR consumes ~**37%** of the electricity
- Largest controllable **Operating Cost**.
- Space **Cooling** and **Refrigeration** are **#1 & #2** sources of electricity consumption
- EPA warning: A warming of only **1.8°F** could spike cooling energy demand as much as **20%**.
- Moving from coal and oil generated electricity is driving costs up. E.g., 3x to 4x in Europe.
- Pre-Covid-19 studies projected **15% growth** in **HVACR jobs**



Energy Efficiency Options For Existing Commercial Buildings



Decision Criteria



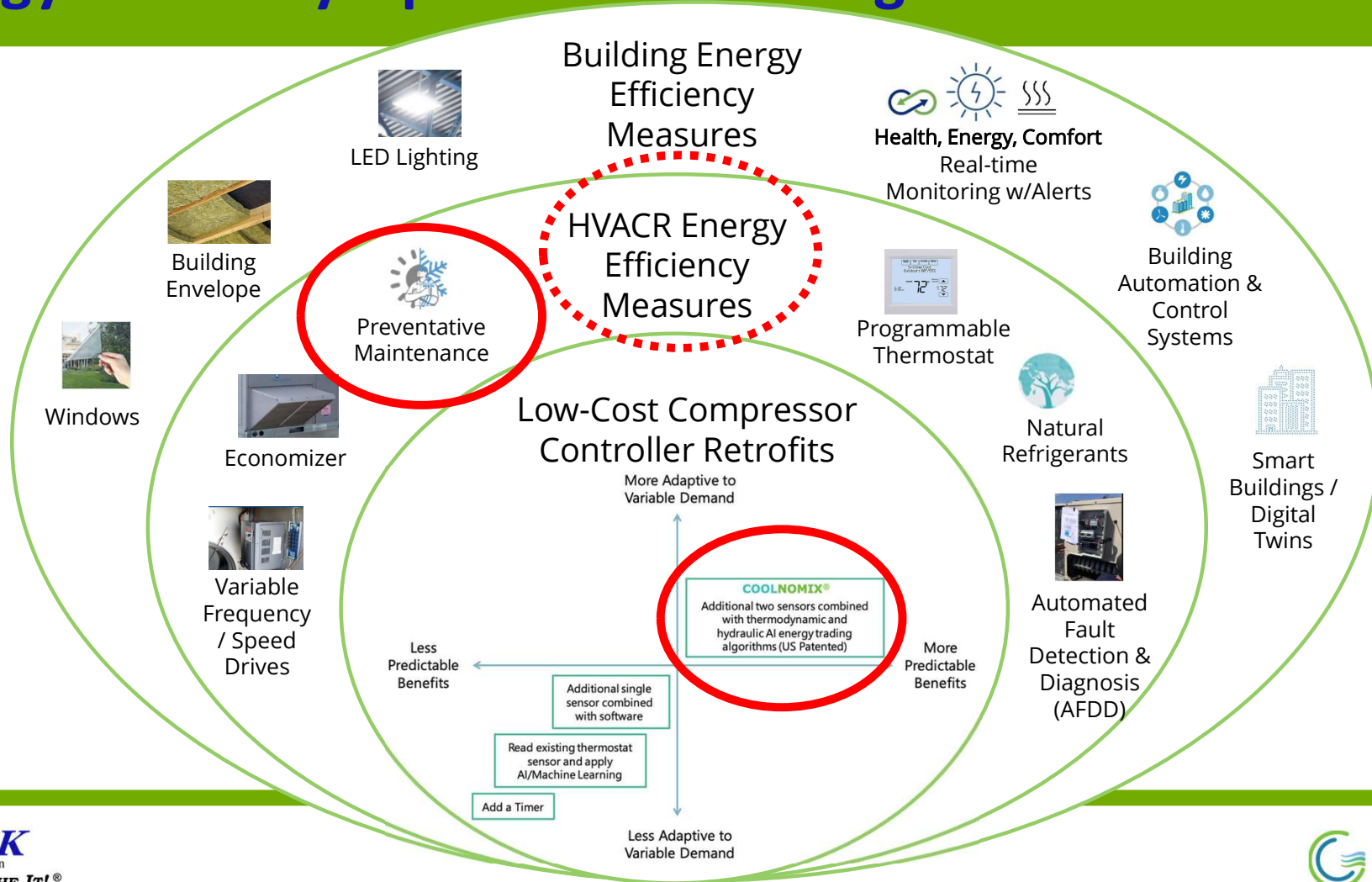
➤ Most Desirable Characteristics:

- Lowest Cost
- Highest Value-to-Cost Ratio
- Quickest to Deliver
- Shortest Payback Period

➤ Other Characteristics:

- Safest
- Least Intrusive – During & After
- Minimal Management Involvement

Energy Efficiency Options For Existing Commercial Buildings



Innovative Compressor Controller

COOLNOMIX – A Pacemaker for Compressors



COOLNOMIX AC-01 (Air Conditioning)

Models: 500, 501, CRAC

Compatible DX Units: Packaged Rooftop (RTU), Split, Heat Pump (cooling only)

Certifications: ETL (UL 60730-2-9, UL 60730-1), CE, CTICK, RoHS, and FCC



COOLNOMIX
Setpoints:
61-88 °F

Key Features:

- Dual sensors provide indoor comfort and more precise cooling delivery
- Energy consumption is optimized by reducing compressor runtime once required comfort levels have been achieved
- Compressor health protection ensures a minimum cooling system run-time and a minimum off-time
- Operational status and fault detection via LED lights on outside of unit or via alerts to Bluetooth connected Android mobile device
- Requires no integration or connectivity to function.
- No maintenance required

COOLNOMIX AC-01 (Air Conditioning)

Models: 500, 501, CRAC

Compatible DX Units: Packaged Rooftop (RTU), Split, Heat Pump (cooling only)

Certifications: ETL (UL 60730-2-9, UL 60730-1), CE, CTICK, RoHS, and FCC



COOLNOMIX
Setpoints:
61-88 °F

Energy Consumption Reduction: 20-40% kWh. Varies due to differences in climate, property type, internal heat load, programmable thermostat settings, and ventilation strategies (e.g., fan settings, economizer, VFDs) .

Simple Payback: 6-36 months. Varies due to energy consumption savings (see above), electricity rate, and cost to procure and install

Pricing: Varies by model.
Volume discounts available

Warranty: 3 year Product Warranty

Effective Useful Life: 15+ years

COOLNOMIX AR-01 (Refrigeration)

Models: 700, 701

Compatible DX Units: Walk-In Coolers, Display Cases

Certifications: ETL (UL 60730-2-9, UL 60730-1), CE, CTICK, RoHS, and FCC:

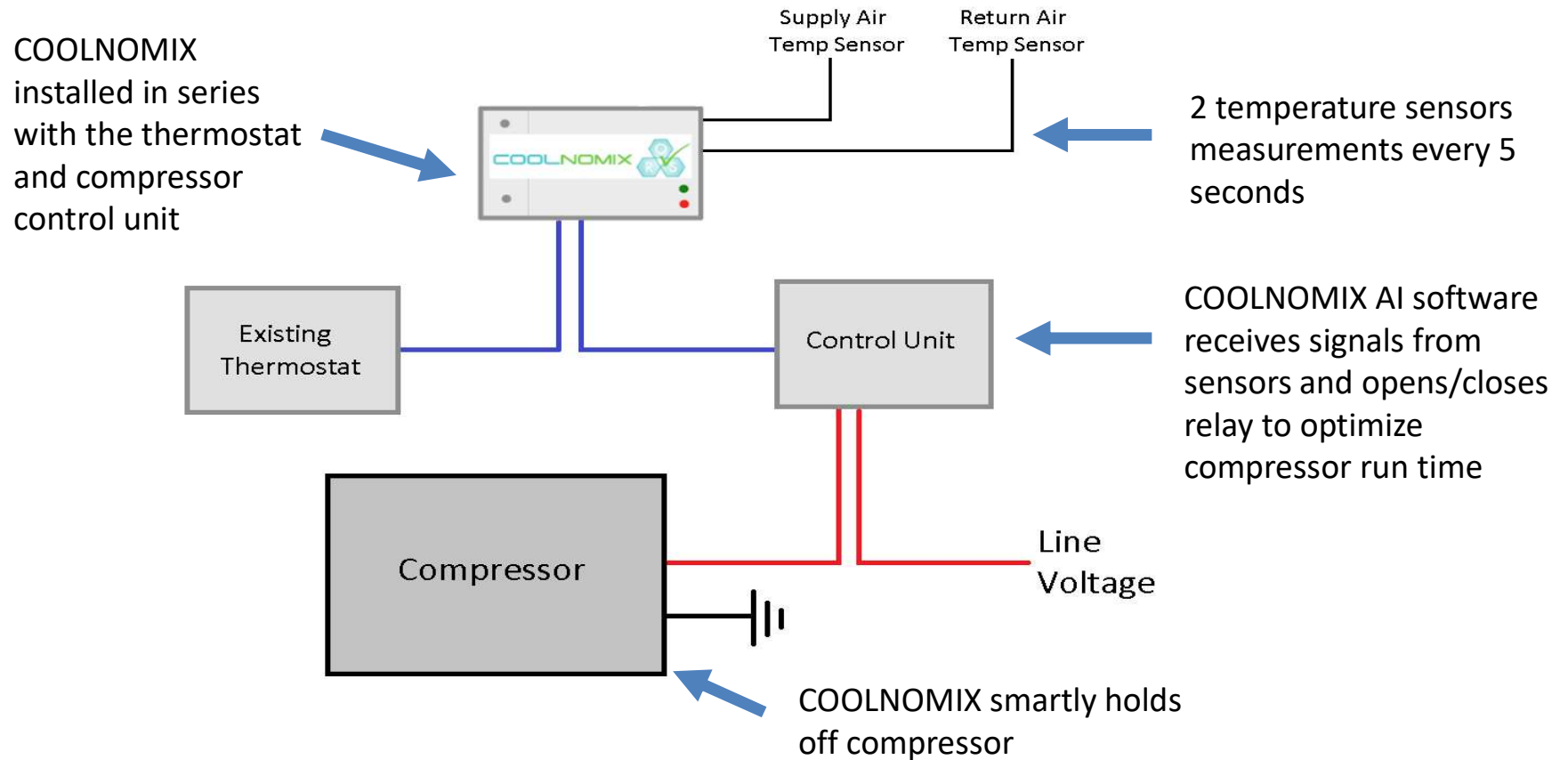


COOLNOMIX
Setpoints:
32-59 °F

Key Features:

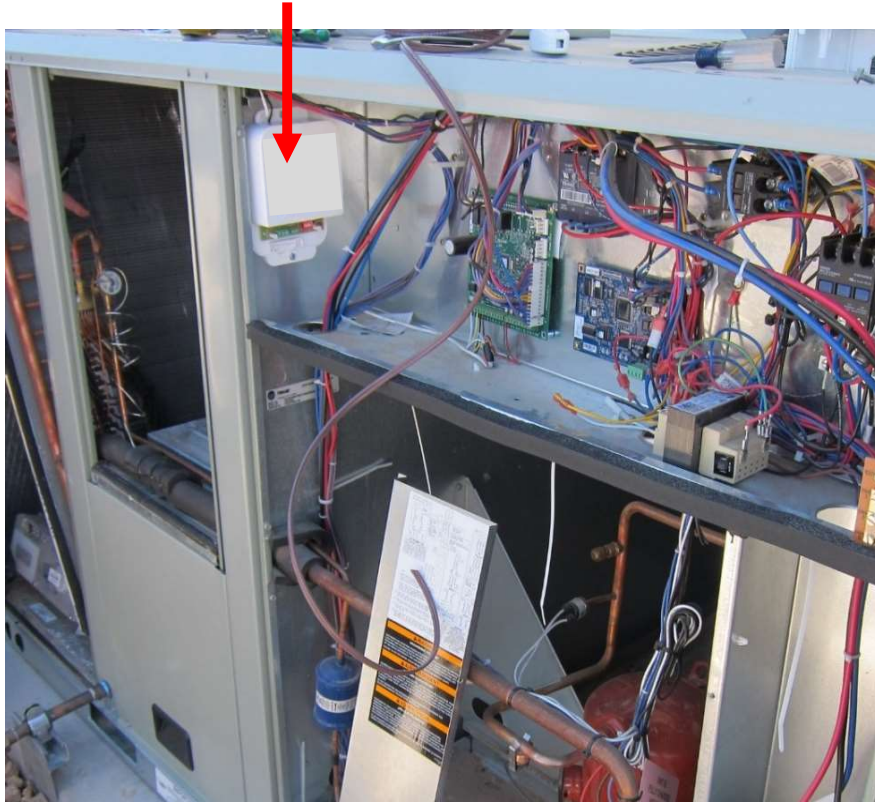
- Dual sensors provide refrigeration product temperature stability and more precise cooling delivery
- Preventing icing on the evaporator coil
- Energy consumption is optimized by reducing compressor runtime once required temperature levels have been achieved
- Compressor health protection ensures a minimum cooling system run-time and a minimum off-time.
- Operational status and fault detection via LED lights on outside of unit or via alerts to Bluetooth connected Android mobile device
- Requires no integration or connectivity to function.
- No maintenance required

Where is COOLNOMIX installed?



COOLNOMIX Installation Samples

In Packaged Rooftop Air Conditioner



In Walk in Cooler

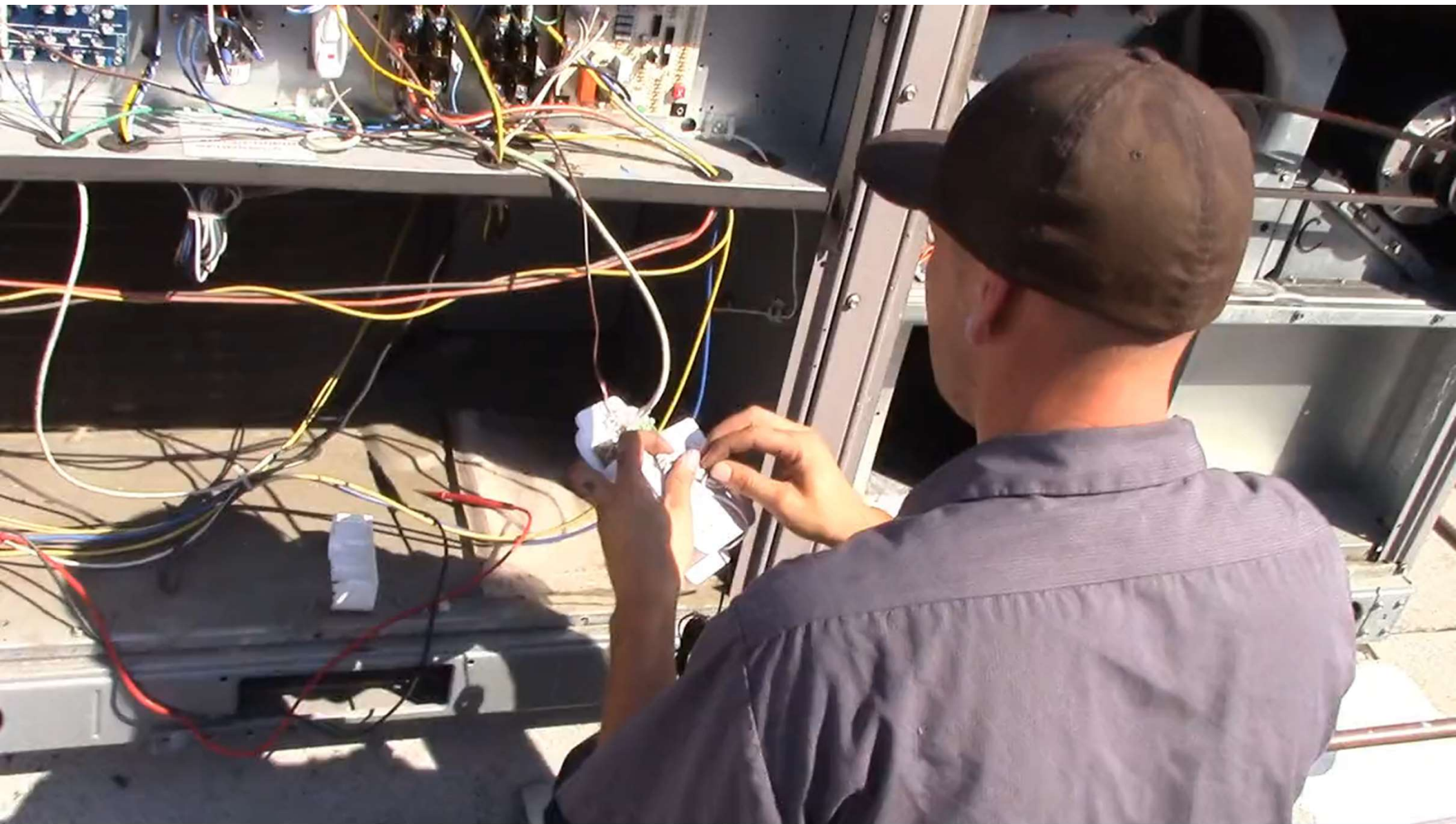




Figure 1

COOLNOMIX Connect for Installation & Operations

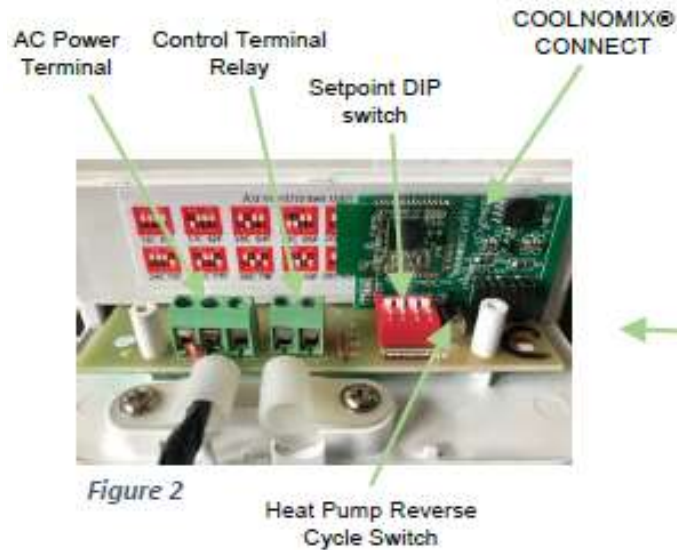
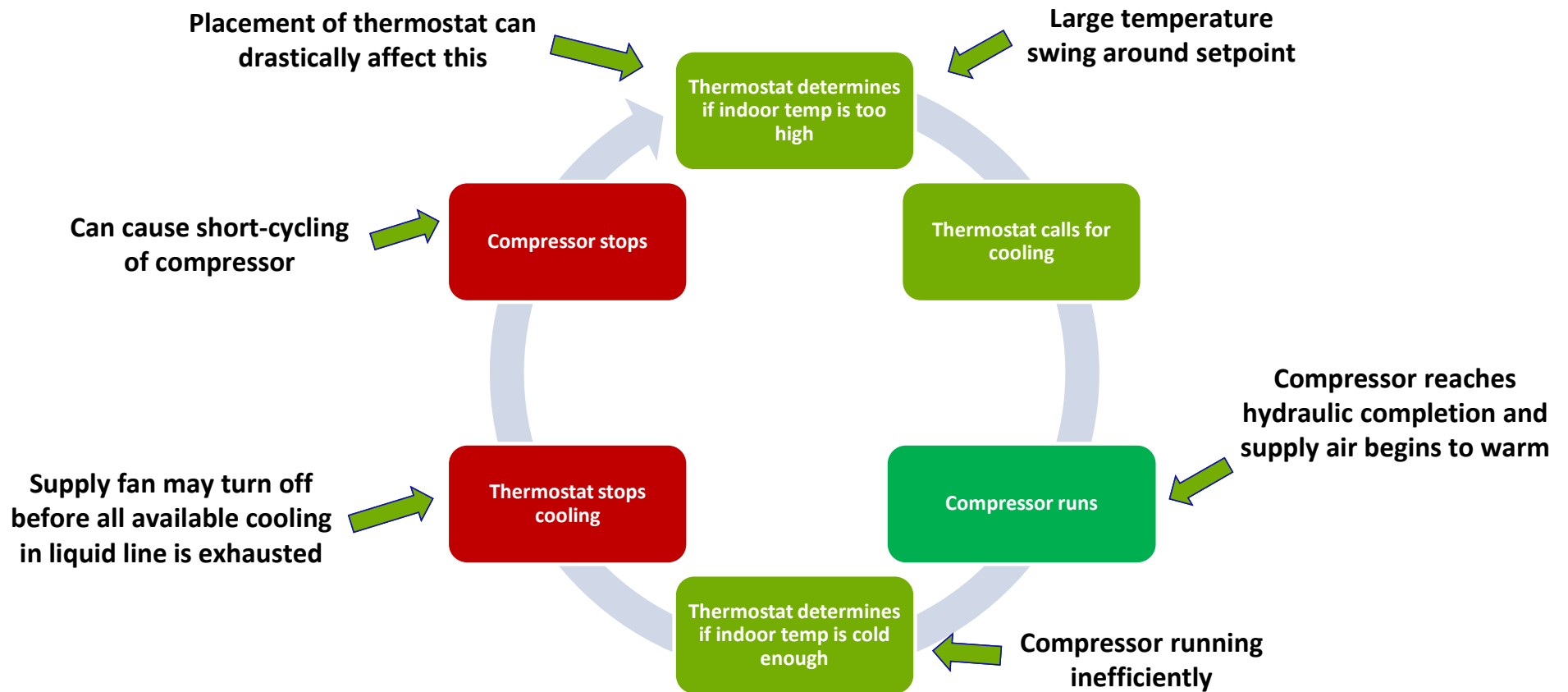


Figure 2

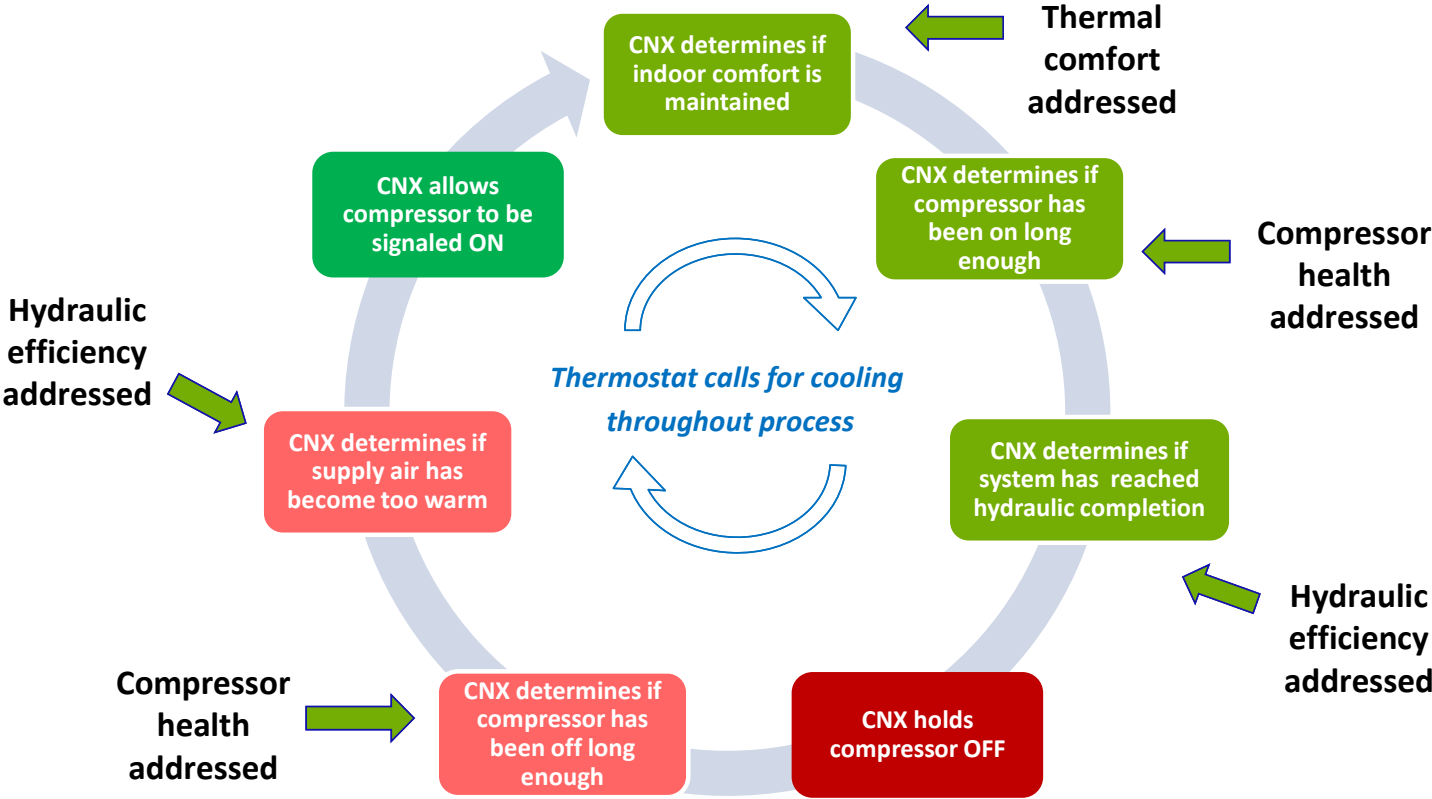


Figure 3

Thermostat in Operation (w/o COOLNOMIX)

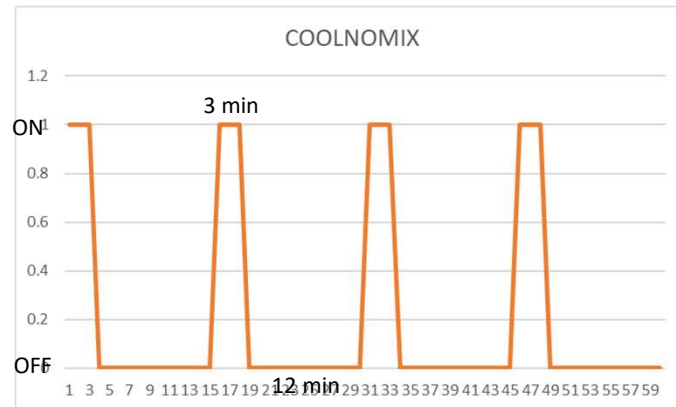
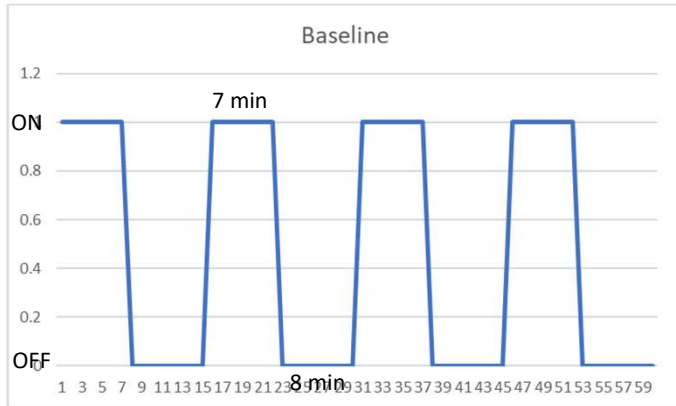


COOLNOMIX (CNX) In Operation



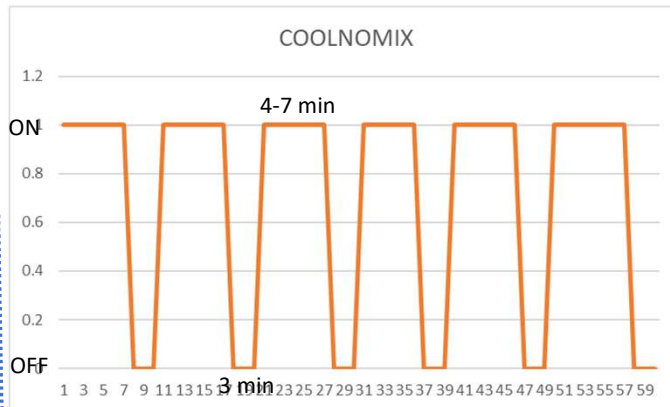
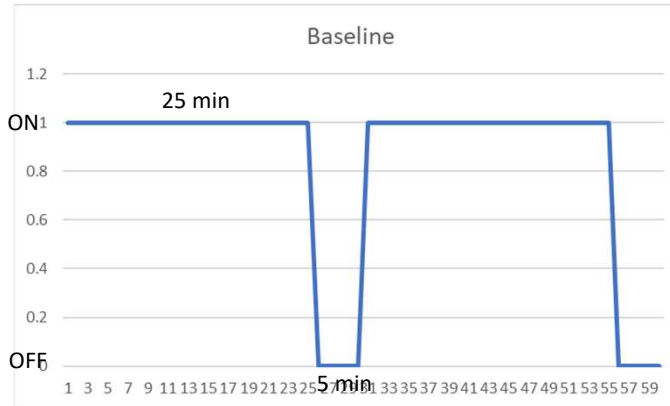
COOLNOMIX – How Does It Save?

Part-Load



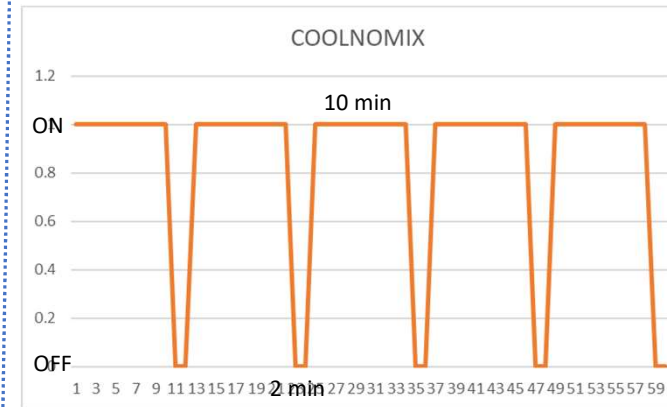
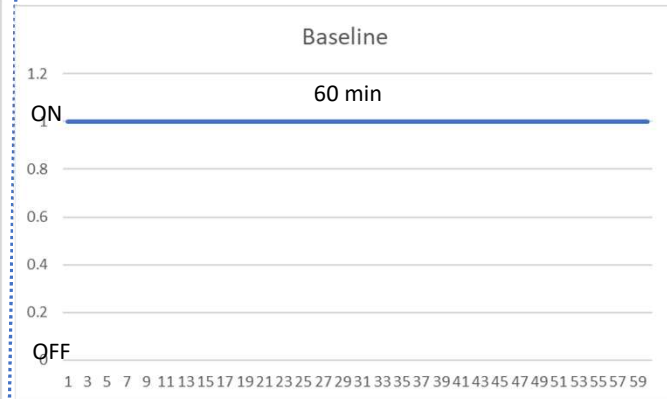
Baseline: 28 min / hr
 COOLNOMIX: 12 min / hr
 Reduction: 57%

Full-Load



Baseline – 50 min / hr
 COOLNOMIX – 36-42 min / hr
 Reduction: 16-32%

Extreme-Load



Baseline – 60 min / hr
 COOLNOMIX – 50 min / hr
 Reduction: 17%

COOLNOMIX Success Stories



Federal Building



McDonald's



Chelsea Public Library



7-11



South Shore Vocational
Technical High School



Outback Steakhouse



Military Building



Hilton



Winthrop Council on
Aging



HSBC



Western Carriers



Sanofi



Medford Vocational
Technical High School



Domino's



JW Marriott



Royal Bank of Scotland



ASM Pacific Technology



Kimberly-Clark



Westpac



Camperdown Cellars



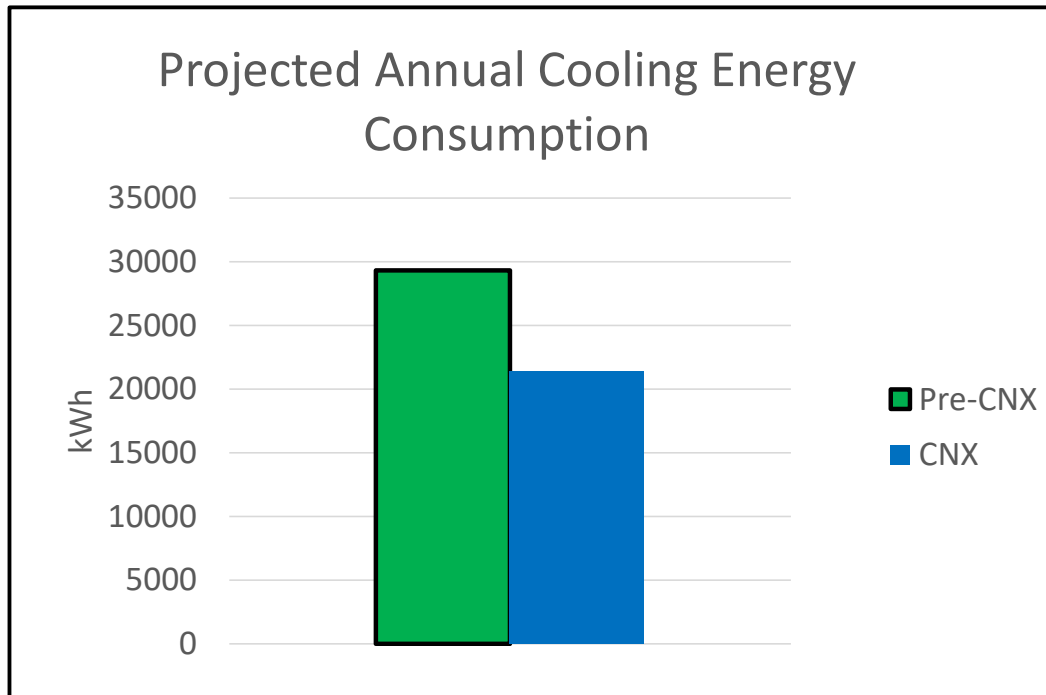
HGC

Success Story: Chelsea Library, Chelsea, MA (2018)

- COOLNOMIX installed on 1 27-ton Carrier AC RTU
- Independent Data Collection and Analysis:
Dynamic Control Technologies
- Objectives:
 - Assist the City of Chelsea with MMBTU reduction goals
 - Provide Chelsea with measurement and verification (M&V) tools that can be used to assess energy saving performance for this study
 - Save City of Chelsea taxpayer dollars



Success Story, Chelsea Library, Chelsea, MA



Projected Annual Savings of **27%**

Annual Energy Savings of **7,923 kWh**

Annual Cost Savings of **\$871**

Indoor Comfort Maintained

- Success Story approved by Department of Public Works and Head Librarian
- All data available for third party review



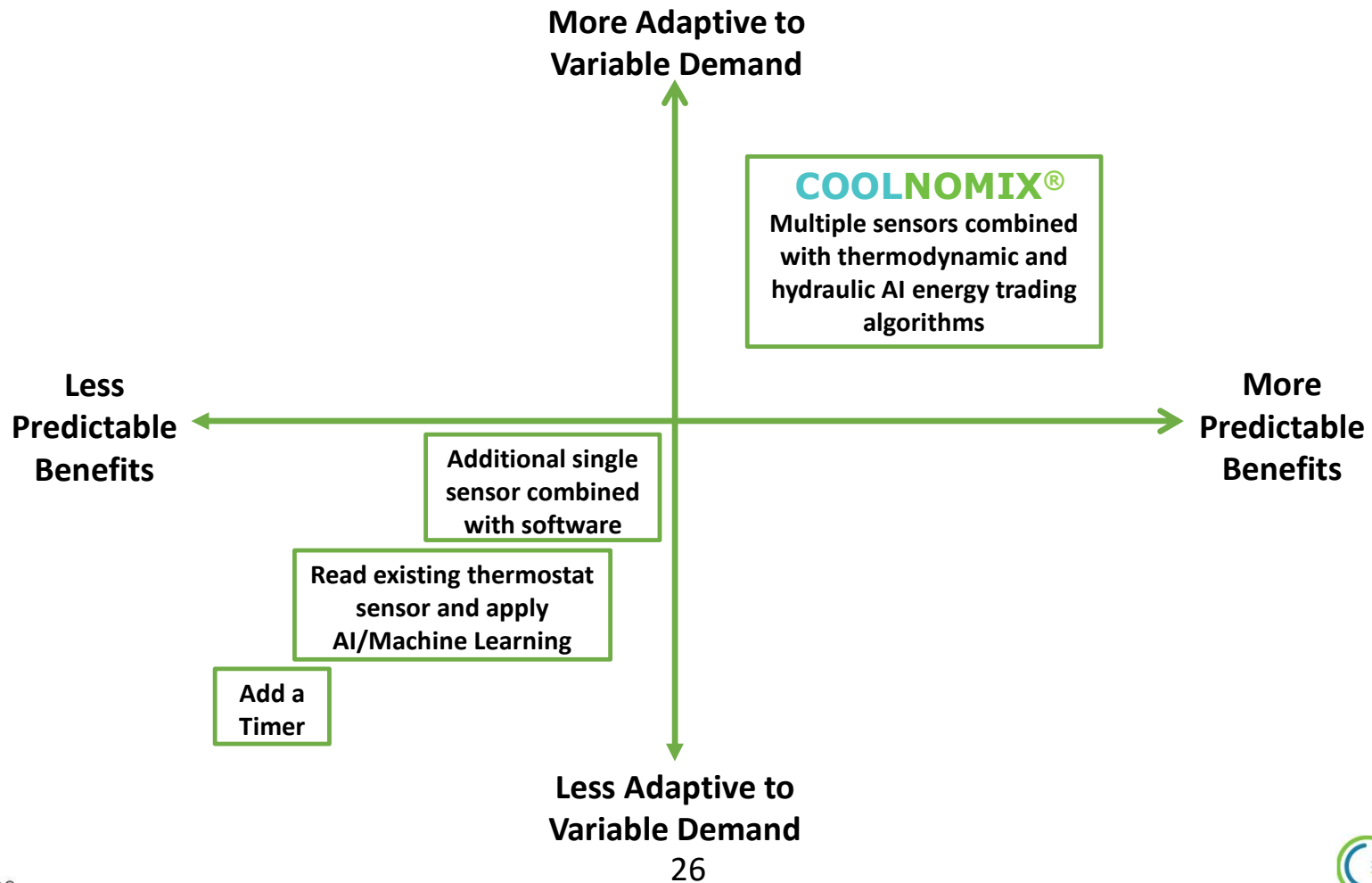
Success Story, JLL / HSBC



- HSBC hired JLL on a Performance Contract to cut energy costs by HK\$5 MM per year
- JLL installed 895 **COOLNOMIX** units in 55 retail offices across 5 Asia-Pacific countries
 - In branches with DX, Ducted, Split-type, and VRV/VRF AC
 - JLL documented an average of 27% savings and a simple payback period less than 1 year

Project	Implementation	Retrofit Costs	% Saved	\$ Saved
LED	Large Project	Very Large	85%	\$1.1 MM
COOLNOMIX	1 hour ea.	Very Low	27%	\$3.3 MM

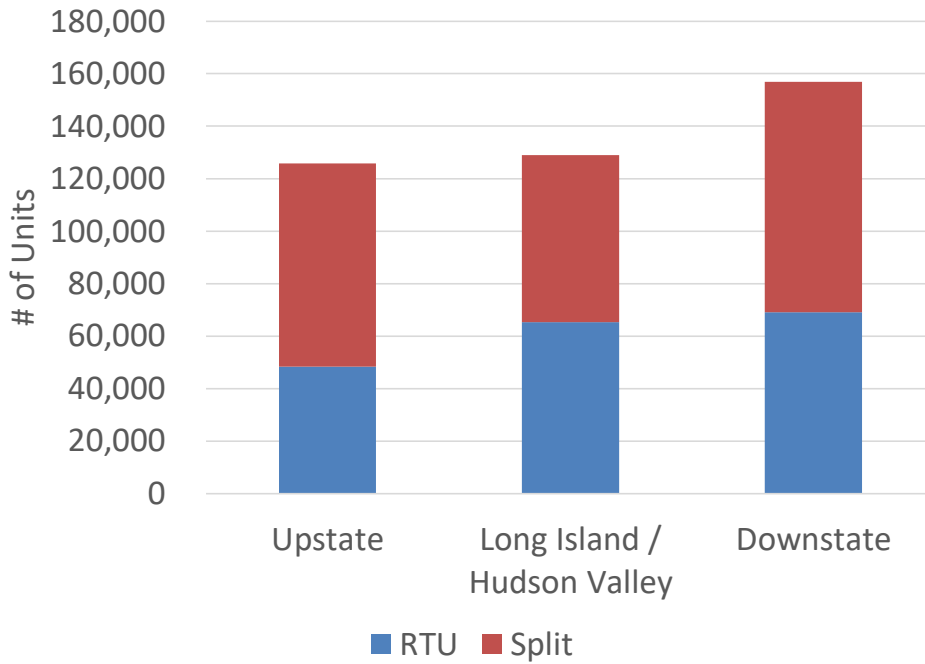
Low-cost Compressor Retrofit Options



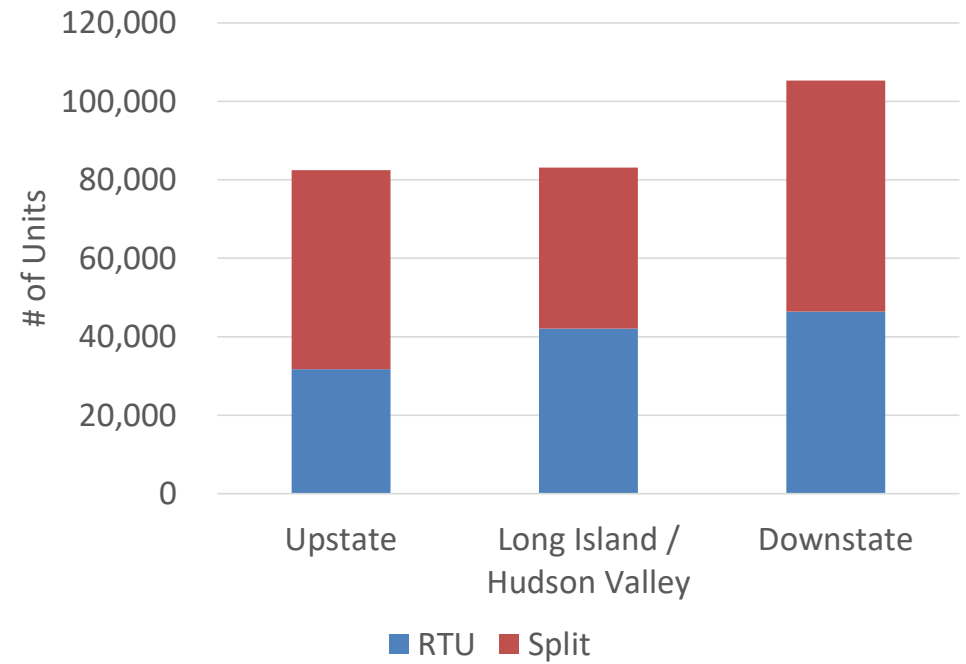
COOLNOMIX NYS Market Potential

Air Conditioning

<75 KW (Small Commercial)



>75 KW (Large Commercial)



COOLNOMIX Stakeholder Benefits



HVAC/R Contractors
Project Expeditors / ESCOs
Energy Efficiency Consultants

- ✓ Differentiate your brand
- ✓ Attract new customers
- ✓ Increase revenue
- ✓ Increase recurring revenue
- ✓ Increase workforce quality
- ✓ Increase installation quality
- ✓ Increase early problem detection



Building Owners
Property Managers
Business Owners / Tenants

- ✓ Keep employees safe
- ✓ Keep workplaces healthy
- ✓ Increase workforce productivity
- ✓ Improve workforce retention
- ✓ Improve brand value
- ✓ Reduce energy waste, consumption, cost
- ✓ Avoid costly system failures
- ✓ Offset increasing utility rates



Economic Development Agencies
Public Services Commissions
Electric Utilities

- ✓ Reduce GHG emissions
- ✓ Increase energy efficiency
- ✓ Accelerate economic growth
- ✓ Reduce customer energy bills
- ✓ Increase customer satisfaction

When do things go wrong with **COOLNOMIX**?

- **Installation:** **COOLNOMIX** should only be installed on DX units that have been properly maintained. Otherwise, **COOLNOMIX** will likely be installed and/or commissioned incorrectly, requiring an additional trip to correct the installation.
 - **COOLNOMIX** sensor readings will be higher or lower than they should be
 - **COOLNOMIX** setpoint may be set incorrectly
 - **COOLNOMIX** may never be engaged; thermostat will remain in control

Preventive Maintenance services are frequently combined with a **COOLNOMIX** installation

Preventive Maintenance (PM)

Why is PM better than Traditional (Reactionary) Maintenance?

BOTH ensure safety and comfort. In addition:



Preventive Maintenance:

- Saves more money while Reducing Risks
- Reduces Complaints, Emergency Maintenance and Costly Interruptions
- Extends Life
- Enables Service to anticipate workloads
- Prevents Crisis Management – by both owners and service teams

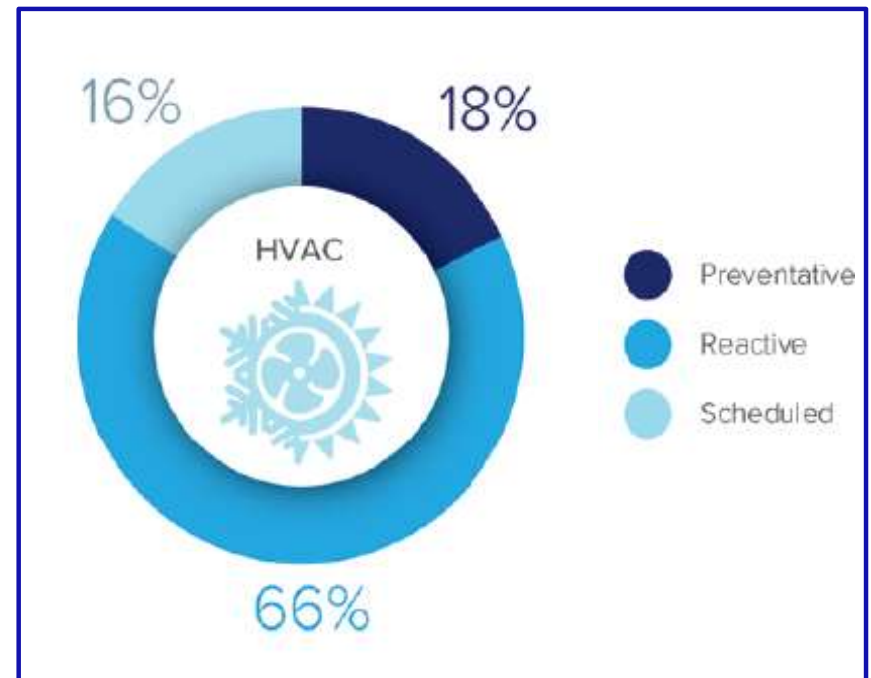
Example: Outside air-side economizer problems:

- Over 60% in the field have failed!
- They may fail while open

NY Maintenance Practices

Most businesses wait until their systems break down before calling for repairs, which is NOT recommended...by anyone.

- **Estimate >700,000 DX Units across NYS**
- **Reactive:** 66% only service after HVACR equipment breaks!
- **Basic:** 16% schedule simple maintenance, based on manufacturers' recommendations.
- **Preventive:** Less than 20%



NYSERDA Commercial Baseline Study
Vol. 3 HVACR Market Assessment

What's Wrong with Doing Nothing?

Common Efficiency ¹ Problems	% of Units
Average Repair	~80%
Coils (NY)	80%
Refrigerant Charge	45% - 77%
TxV (Thermal Expansion Valve)	7%
Fan Belts	TBD
Filters	TBD
Fans Run During Unoccupied Periods	>30%
Economizer Operation	>60%



- 1 Unit Performance typically **deteriorates by 35%** over the life of the equipment
 - A With PM, efficiency decreases 1% to 2% per year
 - B **Without PM**, efficiency decreases **~5%** per year

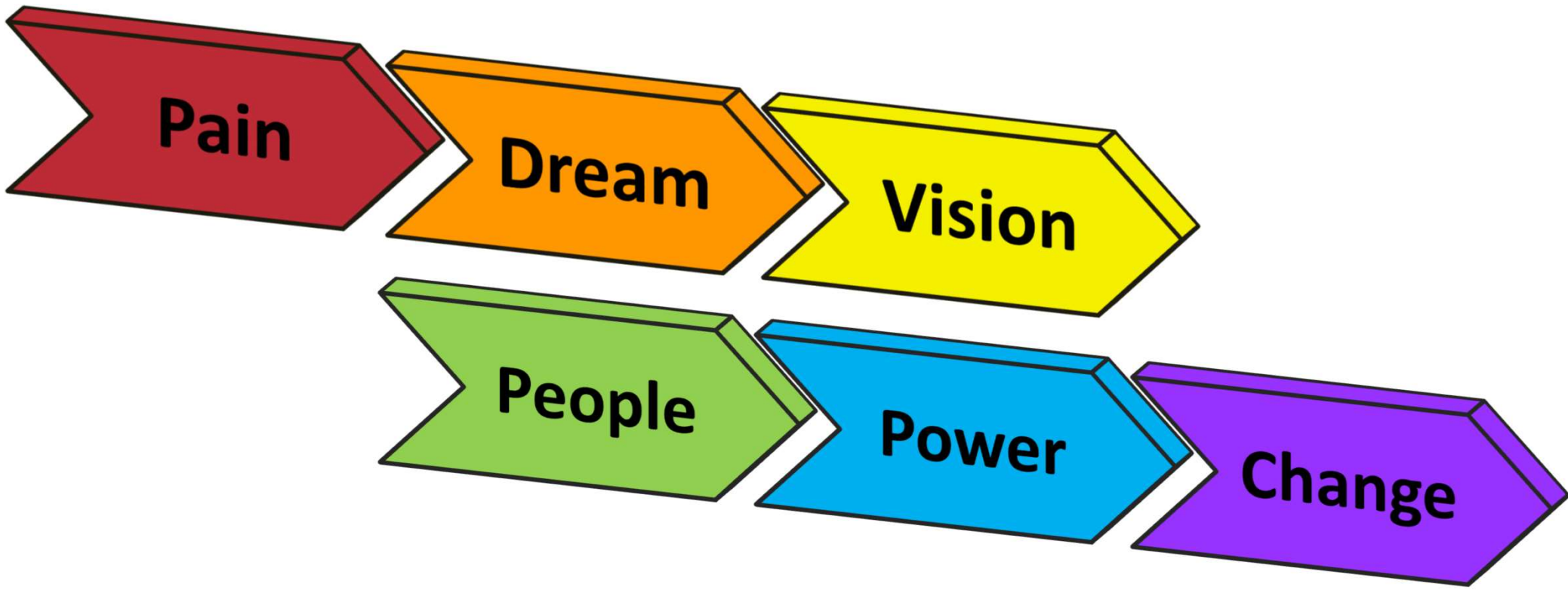
What's Wrong with Doing Nothing?

Common Efficiency ¹ Problems	% of Units	PM Saves
Average Repair	~80%	26%
Coils (NY)	80%	11% ²
Refrigerant Charge	61%	15%
TxV (Thermal Expansion Valve)	7%	14%
Fan Belts	TBD	6%
Filters	TBD	7%
Fans Run During Unoccupied Periods	>30%	6%
Economizer Operation	>60%	Varies



- Unit Performance typically **deteriorates by 35%** over the life of the equipment
 - With PM, efficiency decreases 1% to 2% per year
 - Without PM**, efficiency decreases **~5%** per year
- ASHRAE** / Carbon Trust study documented **15% - 25%** savings, on average

What Drives Change?



How to Present Financial Impact

While people **like to Save**, people **HATE to WASTE!**

Example

Current Cost	% Saved	New Cost	\$ Saved = \$ Wasted	% Wasted
\$100	20%	\$80	\$20	25%

Simple Formula to convert % Saved to % Wasted:

$$\% \text{ Wasted} = \frac{\% \text{ Saved}}{1 - \% \text{ Saved}} = \frac{20\%}{1 - 20\%} = 25\%$$

What's Wrong with Doing Nothing?

Common Efficiency ¹ Problems	PM Saves	No PM Wastes
Average Repair	26%	35%
Coils (NY)	11% ²	13% ²
Refrigerant Charge	15%	18%
TxV (Thermal Expansion Valve)	14%	17%
Fan Belts	6%	7%
Filters	7%	8%
Fans Run During Unoccupied Periods	6%	7%
Economizer Operation	Varies	Varies



- Unit Performance typically **deteriorates by 35%** over the life of the equipment
 - With PM, efficiency decreases 1% to 2% per year
 - Without PM**, efficiency decreases ~**5%** per year
- ASHRAE / Carbon Trust study documented **15% - 25%** savings, on average

What's Wrong with Doing Nothing?

Common Efficiency ¹ Problems	No PM Wastes ³	
Average Repair	35%	\$276
Coils (NY)	13% ²	\$121
Refrigerant Charge	18%	\$165
TxV (Thermal Expansion Valve)	17%	\$159
Fan Belts	7%	\$72
Filters	8%	\$77
Fans Run During Unoccupied Periods	7%	\$72



- 1 Unit Performance typically **deteriorates by 35%** over the life of the equipment
 - A With PM, efficiency decreases ~1% to 2% per year
 - B **Without PM**, efficiency decreases ~**5%** per year
- 2 ASHRAE / Carbon Trust study documented **15% - 25%** savings, on average
- 3 Typical 5 Ton Unit in NYC

Untapped Market – Cleaning Refrigeration Coils

Refrigeration Units	1-Door in CA	2-Door In CA	1-Door in NY	2-Door In NY
Electric Rate	\$0.11	\$0.11	\$0.14	\$0.14
Dirty (Daily kWh)	20	33	21	33
Dirty (Annual kWh)	7,400	12,000	7,500	12,000
Annual Cost Dirty	\$814	\$1,320	\$1,076	\$1,721
Annual Cost Clean ^{1,2}	\$432	\$693	\$860	\$903
kWh Clean	3,925	6,300	6,000	6,300
kWh Saved	3,475	5,700	1,500	5,700
PM Saves	47%	48%	20%	48%
GHG Saved (Lbs CO2)	5,420	8,890	2,340	8,890
% Wasted	89%	90%	25%	90%
\$ Wasted	\$382	\$627	\$215	\$817



- 1 **20%** – ASHRAE Study
- 2 **47%** – Food Service Tech Center (San Ramon, CA)/City of San Francisco Environment Department
- 3 **8% Fouling per Month** – After thorough cleaning

Preventive Maintenance Helps

Customers	Installers & Service Providers
<ol style="list-style-type: none"> 1. Reduce Operating Costs 2. Stop Wasting 30% to 70% on Cooling / Refrigeration 3. Improve Workplace Comfort / Decreases Food Spoilage 4. Avoid HVACR Downtime 5. Prevent Unexpected Expenses & Crisis Management 6. Reduce Complaints – which Improves Productivity & Customer Experience 7. Increase Equipment Longevity & Lifetime Value ~30% 8. Minimize Equipment Failures 9. Avoid Unnecessary GHG emission 10. Offset Increasing Electricity Rates 11. Save on Labor Rates 	<ol style="list-style-type: none"> 1. Generate New Revenue <ol style="list-style-type: none"> A. Increase Customer Spend B. Work During Off-peak Months 2. Attract New customers 3. Reduce Emergency Calls and Crisis Management 4. Help Existing Customers 5. Attract & Retain Quality Employees 6. Increase Utilization of Tech Resources 7. Support Customers Dealing with Covid by Increasing Outdoor Air Ventilation at the Lowest Cost

Convenience Store Example

Assumptions	Year Built	Tons	Commercial Rate	Location	Annual Cost
RTU	2009	5	\$0.1563	Buffalo	\$1,103

Energy Efficiency Option	Saves	Avoids Wasting	Avoids Wasting	Annual Cost
No Change	0%	0%	\$0	\$1,103
PM Only	26%	35%	\$287	\$816
COOLNOMIX	30%	43%	\$245	\$571
Combo: PM & COOLNOMIX	48%	93%	\$532	

Huge Opportunity – Lowest Hanging Fruit



PM Q&A

- Q1
- Q2
- Etc.

Break! – 15 Minutes



NYSERDA COOLNOMIX Demonstration Project

- Background / Objectives
- Scope
- Project Funding - At **NO COST** to Contractors or Customers
- HVAC Wireless Health Check Equipment Available
- Contractor Roadmap – NYSERDA COOLNOMIX Demonstration
- Host Site Roadmap – NYSERDA COOLNOMIX Demonstration
- Project Team Contacts

Background / Objectives

- This project seeks to demonstrate the greenhouse gas and energy benefits of the **COOLNOMIX** product, a compressor-controller retrofit, in small commercial buildings across NYS
 - **COOLNOMIX** claims avg. 30% air conditioning energy reduction while maintaining or improving thermal comfort
- The **COOLNOMIX** product shall be installed and evaluated in a variety of building types and climate zones in NYS
- The project shall produce Host Site evaluation results, a market survey, and NYS Partners, all of which should assist with the commercialization and market penetration of the **COOLNOMIX** product in NYS

Project Scope

- 80-100 HVAC systems across 30+ small commercial locations
 - Food & Beverages – convenience, grocery, full-service and fast food restaurants
 - Non Food Retail – soft goods, hard goods
 - Offices – professional (dentist, doctor, vets, lawyer)
 - Financial Services – retail banks, insurance, investment
- Eligible host sites that are those that pay into the NY Clean Fund (i.e., National Grid, NYSEG, RGE, Con Edison, Central Hudson, Orange & Rockland)

Project Funding

At **NO COST** to Contractors or Customers, Sponsors Provide:

- All customer equipment
- New technology and installation training
- Sales training, materials, and support to help grow revenues more quickly while helping Customers save money
- **Payment** for Contractors to:
 - Diagnose and perform AC Tune-up using the latest wireless tools
 - Baseline each AC unit
 - Install and commission **COOLNOMIX**, a compressor-controller retrofit device
 - Install performance monitoring equipment for third party engineering firms to evaluate and document **COOLNOMIX** benefits
- The monitoring equipment and **COOLNOMIX** devices shall remain the property of the host site after the project completed

HVAC Wireless Health Check Equipment Available

- measureQuick - wireless tool platform that streams data runs diagnostics
- Redfish iDVM 550 Wireless BlueTooth Power Clamp Meter
- Testo Complete Smart Probe Kit for measureQuick
 - Two Testo 549i high-pressure measuring instruments
 - Three Testo 605i thermohygrometers
 - Three Testo 115i clamp thermometers for pressure, (air) temperature and humidity measurement
 - Two Testo 510i differential pressure probes.

There are 5 HVAC Wireless HealthCheck Kits that can be borrowed.

Contractor Roadmap – NYSERDA COOLNOMIX Demonstration

		Participants							Duration		Target Date
		Project Team		HVAC Contractor			Business				
Step	Purpose	PROTEK	Energy Consultant	Owner / Main Contact	Sr. Sales & Marketing	Technician	Business Contact	Building Contact			
1	Approve NDA	R		R					15 min		
2	Review Sales & Marketing Content			R	O	O			1 hour		
3	Approve NYSERDA Reseller / Installer Paperwork			R					45 min		
4	Identify Target Customers/Prospects	S		R	O				15 min		
5	Joint Calls for Customer Outreach	R			R	O			10 min ea.		
6	Host Site Verbal Commitment				R		R		5 min ea.		
7	Approve NYSERDA Host Site Paperwork						R		30 min		
8	Site Survey	R	O			O	S	IN	1 hr		
9	Training & Installation of Performance Monitoring Equipment	S	R			R	S	IN	1 hr		
10	Data Collection - 2 Weeks		R								
11	Perform AC Diagnostic / Baseline	S				R	S	IN	30 min	TBD - All same date	
12	If Necessary: Maintenance Tune-up / PM					IN	IN	IN	1.5 hrs		
13	COOLNOMIX Training & Installation	S				R	S	IN	1.5 hrs		
14	Sales & Marketing Training - PM / COOLNOMIX								1 hr		
15	Ongoing Data Collection	S	R						TBD		
16	PM / COOLNOMIX Sales & Marketing Campaign	S		O	O				TBD		
Required Time (non-billable)				3.5 hours			35 minutes				

Abbreviations: R = Required; O = Optional; S = Support; IN = If Necessary

Host Site Roadmap - NYSERDA COOLNOMIX Demonstration

		Participants							Duration		Target Date	
		Project Team		HVAC Contractor			Business					
Step	Purpose	PROTEK	Energy Consultant	Owner / Main Contact	Sr. Sales & Marketing	Technician	Business Contact	Building Contact				
1	Host Site Verbal Commitment				R		R		5 min			
2	Approve NYSERDA Host Site Paperwork						R		30 min			
3	Site Survey	R	O			O	S	IN	1 hr			
4	Training & Installation of Performance Monitoring Equipment	S	S			R	S	IN	1 hr			
5	Data Collection - 2 Weeks		R									
6	Perform AC Diagnostic / Baseline	S				R	S	IN	30 min	TBD - All same date		
7	If Necessary: Maintenance Tune-up / PM					IN	IN	IN	1.5 hrs			
8	COOLNOMIX Training & Installation	S				R	S	IN	1.5 hrs			
9	Ongoing Data Collection	S	R						TBD			
Required Time (non-billable)				3.5 hours			35 minutes					

Abbreviations: R = Required; O = Optional; S = Support; IN = If Necessary

Project Team Contacts



Joe Mueller



Yan Zhou



Dave Ableman



Spencer Jawitz



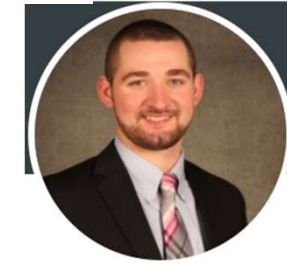
Dennis Landsberg



Ron Slosberg



Michael Barbasch



Aaron Schauger

COOLNOMIX Support

- Financial Impact to Your Business
- Marketing and Sales Support
- Installation and Operations Support

Financial Impact of Combining PM With CNX

Sample Assumptions			
Year	1	2	3
FT Equivalent Service Techs	10	10.5	11.6
PM Hours / Unit / Yr	4.0	4.0	4.0
Billable Hours / Tech	2,000	2,000	2,000
Billable Utilization	69%	74%	77%
HVAC units/tech	344	369	384
Total Units to Service	3,438	3,872	4,432
Hourly Rate	\$110	\$113	\$117
Tech Cost per Hour	\$50	\$52	\$53
Burden	40%	40%	40%
Tech Cost w/ Burden	\$70	\$72	\$74
Hours per install	1.5	1.0	1.0
# of techs per call	1.2	1.2	1.2
% of Units under PM	50%	57%	64%
Total Units under PM	1,719	2,207	2,837
Dedicated Service Sales	1	1	1
% Techs Trained on CNX	25%	50%	75%
Trained Techs	2.5	5	9
% that add CNX	5%	10%	25%

Legend	
Yellow	Standard Assumptions
Blue	Most Critical Installer Specific Inputs
Green	Check Points, based on calculations, for you to verify

Results			
Year	1	2	3
Units COOLNOMIX Sold	172	387	1,108
GP per CNX tech hour	\$192	\$287	\$326
Incremental Units under PM	0	488	630
Incremental PM Revenue	\$0	\$221,261	\$293,947
Incremental PM Cost	\$0	\$140,802	\$187,057
Incremental PM GP	\$0	\$80,458	\$106,890
Incremental Revenue	\$190,266	\$625,856	\$1,456,364
Incremental GP	\$59,245	\$213,986	\$541,033
Profit Margin	31%	34%	37%
Incremental Revenue per Tech	\$19,027	\$59,605	\$126,092

How To Identify Those Most Likely To Act Quickly

Key characteristics:

- Low Profit Margins
- Long Hours of Operation
- Own Equipment
- Own or Co-own building
- Due to Covid, plan to (or should) increase outdoor air ventilation



Non-starters:

- Chilled Water Systems
- Freezers
- Residential

Identifying Best Prospects

Best-fit Industries:

- Grocery: grocers, convenience stores, gas stations with convenience store
- Healthcare: nursing homes, assisted living facilities and similar operations, healthcare Facilities (e.g. Clinics), doctor's offices
- Food Services: restaurants, coffee shops and cafes
- Other: small banks / credit unions, fitness facilities, indoor recreational sports facilities
- Non-Mall Retail: automotive, furniture and home furnishings

Largest Opportunities with Multiple DX Systems:

- Banks
- IT/Data Center CRAC systems
- Restaurant Chains
- Multi-site businesses
- Cooled Warehouse/Storage



Net Margins - by Industry

Industry Name	2018	2019	2020	Covid-19 Impact
Hotel/Gaming	17.62%	9.88%	-30.78%	-40.66%
Education	6.81%	9.59%	-4.82%	-14.42%
Food Wholesalers	2.05%	1.11%	-0.36%	-1.47%
Retail (Grocery and Food)	2.85%	1.44%	2.20%	0.76%
Business & Consumer Services	6.47%	3.83%	2.47%	-1.36%
Healthcare Support Services	2.46%	1.78%	2.63%	0.85%
Retail (General)	1.90%	2.44%	2.79%	0.35%
Hospitals/Healthcare Facilities	0.78%	2.51%	3.70%	1.18%
Farming/Agriculture	3.44%	2.47%	3.81%	1.34%
Retail (Automotive)	3.90%	3.55%	3.84%	0.29%
Restaurant/Dining	12.11%	10.57%	5.69%	-4.88%
Beverage (Alcoholic)	24.35%	7.94%	11.95%	4.01%
Drugs (Pharmaceutical)	10.94%	18.38%	14.10%	-4.28%
Financial Svcs. (Non-bank & Insurance)	20.06%	26.94%	20.13%	-6.81%
Banks (Regional)	28.99%	30.50%	23.79%	-6.71%
Total Market	8.89%	7.71%	5.05%	-2.66%

How to Present Impact based on Net Margin

Terms:

- Sales aka Top Line
- Net Profit aka Bottom Line

$$\text{Net Margin (\%)} = \frac{\text{Net Profit (\$)}}{\text{Sales (\$)}}$$

$$\frac{\text{Net Profit (\$)}}{\text{Net Margin (\%)}} = \text{Sales (\$)}$$

Convert Net Margin to Equivalent Incremental Sales

$$\frac{\text{Net Profit (\$)}}{\text{Net Margin (\%)}} = \text{Sales (\$)}$$

Industry Name	2020	
Retail (Grocery & Food) / Convenience	2.20%	\$24,160
Retail (General)	2.79%	\$19,046
Hospitals/Healthcare Facilities	3.70%	\$14,383
Retail (Automotive)	3.84%	\$13,831
Restaurant/Dining	5.69%	\$9,342

$$\frac{\$1}{2.20\%} = \frac{\$1}{.022} = \$45.44 \rightarrow \frac{\$532}{.022} = \$24,160$$

Marketing and Sales Support NYSERDA Program Flyers for Customers

CoolGreenPower

80% of NYS businesses are wasting 30-70% of their energy costs for air conditioning. Are you one of them?

You can participate, for FREE in a project designed to immediately reduce air conditioning energy usage and cost while maintaining indoor comfort.

If you are a Convenience Store, Fast-Food Restaurant, Full-Service Restaurant, or Grocery Store, this could be the cost reduction opportunity you've been looking for!

Space cooling is a substantial contributor to annual electricity costs and is essential for occupant health, comfort, and productivity.

For small businesses who own or rent building space, energy costs are one of the top three business expenses.

CONTACT US

[in](#) [t](#) [f](#)

@CoolGreenPower
(646) 867-7272
coolgreenpower.com

Designed to maintain or improve occupant comfort, and minimize occupant involvement, the project scope includes:

- Installation of COOLNOMIX device and the other equipment needed to monitor AC electricity consumption, indoor space conditions, and outdoor weather
- An independent NYS energy engineering company to:
 - o Supervise equipment installation/commissioning
 - o Perform data analysis
 - o Produce site reports
- Optional online surveys for occupant(s) to document experiences, which will be compared to indoor comfort data captured

Building occupants don't need to do anything differently.

Enrollments will be processed first come, first served. If you are interested, call (646) 867-7272 to schedule a phone conversation to learn more. This project is supported and co-funded by NYSERDA's Advanced Buildings Program.



CoolGreenPower

Get an Instant Savings Estimate
www.coolgreenpower.com/save
617-505-1004


COOLNOMIX®
Air Conditioning (AC-01) Product Details

An energy efficiency add-on technology (AoT) that helps an existing Direct Expansion (DX) cooling system maintain or improve indoor comfort while reducing cooling system energy consumption by 20%-40%.

- Dual sensors provide indoor comfort quantification and more precise cooling demand detection for environments within the range of 61-88°F.
- Energy waste is reduced by optimizing compressor run-time. COOLNOMIX can only interject when the existing control system is calling for cooling.
- Compressor life expectancy is extended due to reduced compressor runtime, while compressor health protection ensures a minimum cooling system run-time.
- 3-year manufacturer's warranty and expected lifetime of 10+ years.

20-40% Energy Reduction

AC-01 50k systems sized < 5 tons
AC-01 50k systems sized > 5 tons
AC-01 CRAC: Computer Room systems sized > 5 tons



Installation / Commissioning

- Installation takes 1-1.5 hours, including commissioning by a licensed HVAC/R technician or electrician.
- Non-invasive installation respects existing cooling system warranty.
- COOLNOMIX Connect mobile device application provides real-time access to dual sensor temperatures, compressor runtime data, and system operations.

Operations / Maintenance

- COOLNOMIX Connect application can be used for fault detection and diagnostics.
- No operational maintenance is required.

Dimensions	7" x 4.4" x 1.5"
Unit Weight	11.7 oz.
Electrical Supply	110V-250V AC 50/60 auto-switching
Current	2mA (230), 1mA (110)
Operating Environment	30°F to 131°F, RH to 95%
Storage Environment	-13°F to 185°F, RH 15% to 95%
Certifications	ETL (UL 60730-2-9, UL 60730-1), CE, CTIO, RoHS, and FCC
Temperature Settings	NTC type, -580°F to 3020°F
Relay	Normally closed, closes on power failure Voltage: 0 to 250V (AC or DC) Current: 10A continuous/16A peak

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Marketing and Sales Support COOLNOMIX Success Stories

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Energy Reduction: 47%
Administered by: Energy Awareness CO2

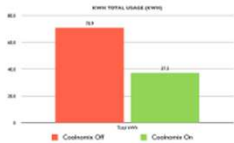
Food sales and service – Fast Food

A 24-hour energy baseline was established on one AC unit at the McGrath's Hill McDonalds restaurant in Windsor, New South Wales, Australia. Energy Awareness CO2 along with Future Air installed COOLNOMIX and measured energy use for a comparable 24-hour period during April.



Installation	Baseline	COOLNOMIX®	Energy Reduction
One AC Unit	70.9 kWh/day	37.3 kWh/day	33.6 kWh/day 47%

Conclusion
Electricity usage data indicated that when COOLNOMIX® was installed, the air conditioning was much more efficient while maintaining a comfortable climate within the restaurant.



For a list of success stories, visit <https://www.coolgreenpower.com/en/success-stories>


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Energy Reduction: 37%
Administered by: Vert Energy Group

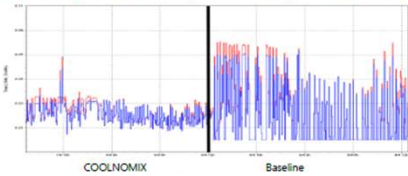
Food Sales & Service - Restaurant

Energy Awareness CO2 (EACO2) installed a COOLNOMIX unit in a walk-in refrigerator at an Outback Steakhouse in Sydney Australia. System performance was measured with the COOLNOMIX unit in operating mode for a 24-hour period and then in bypass mode for a 24-hour period.



Installation	Baseline	COOLNOMIX®	Energy Reduction
Refrigeration	84.7 kWh/day	53.4 kWh/day	31.3 kWh/day 37%

Conclusion
COOLNOMIX made the refrigeration unit much more energy efficient while also maintaining much tighter temperature control in the refrigerator. If extrapolated to an entire year, kWh reductions would be greater than 11,000 with savings over \$2,200.



For a list of success stories, visit <https://www.coolgreenpower.com/en/success-stories>


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Energy Reduction: 25%
Administered by: Vert Energy Group


Food Sales & Service - Convenience Store

7 ELEVEN installed a COOLNOMIX® unit on each of the four air-cooled split air conditioning units in a store located in Kuala Lumpur, Malaysia. This validation test ran for sixteen weeks on one of the split systems. Every two weeks COOLNOMIX® was switched from bypass mode to operation mode to achieve a direct comparison.



Installation	Baseline	COOLNOMIX	Energy Reduction
Four AC Units	20 MWh/month	15 MWh/month	5 MWh/month 25%

Conclusion
The cooling system with COOLNOMIX® was significantly more energy efficient while maintaining a stable and comfortable store temperature. Estimated savings to 7 ELEVEN from the use of COOLNOMIX® was \$592 per month.



For a list of success stories, visit <https://www.coolgreenpower.com/en/success-stories>

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Energy Reduction: 27%
Administered by: Dynamic Control Technologies
Sponsored by: MASSACHUSETTS CLEAN ENERGY CENTER

Municipal – Public Assembly

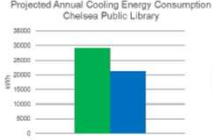
The Town of Chelsea installed a COOLNOMIX® unit on their existing 27-ton Carrier packaged rooftop unit that provides air conditioning throughout the Chelsea Public Library. The independent third-party validation ran for twelve weeks from June – early September 2018. Each week, COOLNOMIX® was alternated between bypass mode to operation mode to achieve a direct comparison.



Installation	Baseline	COOLNOMIX	Energy Reduction
One AC unit	29,304 kWh / yr	21,381 kWh / yr	7,923 kWh / yr 27%

Conclusion
The cooling system with COOLNOMIX® was significantly more energy efficient while maintaining a stable and comfortable store temperature. Estimated annual cost reduction to the Town of Chelsea from the use of COOLNOMIX® is \$1,188.

Projected Annual Cooling Energy Consumption
Chelsea Public Library



For a list of success stories, visit <https://www.coolgreenpower.com/en/success-stories>

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Customizable Proposal Templates

PROTEK
530 West Street • Braintree, MA 02184 • 781.963.8813

March 7, 2022

Will Ragsdale
Bealls Inc.
Director - Logistic Maintenance
2100 47th Terrace East
Bradenton, FL 31203

Dear Will:

Thank you for your interest in evaluating COOLNOMIX®, an energy efficiency retrofit device, to help Bealls Inc. reduce the costs and use of your electric energy along with enhancing the comfort of your employees and visitors.

Designed specifically for decreasing the costs of Direct Expansion (DX) air conditioning, refrigeration and heat pump systems (HVAC/R), tens of thousands of COOLNOMIX® units have already been installed in 46 countries, saving millions of kWhs and drastically shrinking carbon footprints. Satisfied clients include:

Data Centers	Hospitals
Distribution Centers	Hotels
Educational Institutions	Office Buildings
Financial Institutions	Restaurants

We will be in touch with you shortly to further discuss installation details. Should you have any questions in the interim, please do not hesitate to contact us.

System	Annual Energy Consumption (kWh)
Baseline	~28,000
COOLNOMIX	~21,000

Projected Annual Savings of 27%

Annual Energy Savings of **7,923 kWh**

Annual Cost Savings of **\$871**

Indoor Comfort Maintained

Public Facility Case Study

Warmest Regards,
Spencer Jawitz
Account Manager

CLEAN IT OR BREATHE IT!®

PROTEK
CORPORATION
CLEAN IT OR BREATHE IT!®
75 North Main Street • Randolph, Massachusetts 02368 • (781) 963-8813

Financial Analysis of COOLNOMIX® for CES

Tampa Finger Lakes

Air Conditioning

ASSUMPTIONS	
Electric Rate	\$0.10
Annual Hours of Cooling	3,006
Annual Cooling kWh w/o CNX	866,894
HVAC Technician Hourly Rate	\$100
Installation Material per CNX Unit	\$25
Hours per CNX Installation	1.5
Discount Rate	3%
Finance Rate	6%
Reinvestment Rate	6%
Inflation Rate	2%
Total Cost including Installation+Taxes	\$22,997
Sample Savings	30%

Cooling System Information			
Cooling System	SEER	Tons	# of Systems
RTU	13	8	6
RTU	13	5	6
RTU	13	4	3
OAU	13	35	5
OAU	13	50	1
OAU	13	40	1

CNX=COOLNOMIX

Estimated Savings	
Annual Savings	\$25,149
Payback Period	11 Months
Return on Investment	109%
Internal Rate of Return	112%
Savings to Investment Ratio	10.6
Annual Total Emissions Reduced	118.5 Tons
Net Present Value	\$221,164

System	Annual Energy Consumption (kWh)
Baseline	~850,000
COOLNOMIX	~600,000

Annual Energy Consumption and Costs

Confidential between PROTEK Corporation and CES. Not to be shared or distributed.

Additional Marketing and Sales Support

- **COOLNOMIX** Product Overview
- **COOLNOMIX** Technical White Paper
- Custom Events (e.g., Webinars)

Marketing and Sales Support CoolGreenPower Website

- CNX Product Details
- How CNX Works
- Benefits
- Success Stories
- Insights
 - White Papers
 - Presentations
 - Leading Practices
- Installation
- Operations
- FAQ
- Income Estimator (Partners)

The screenshot displays the CoolGreenPower website. At the top left is the logo. The navigation menu includes Technology, Partner With Us, How to Buy, Company, and a Partner Login button. A dropdown menu is open under Technology, listing Products, How It Works, Benefits, Success Stories, Insights, Installation, Support, and FAQ. The main banner features a technician in a green shirt working on a building's energy system, with the headline "Decarbonizing Buildings Through Energy Efficiency" and the sub-headline "to reduce building energy consumption and GHG emissions". Below the banner are two columns: "We Offer" with a lightbulb icon and "You Get" with a bar chart icon. The "We Offer" section lists: Low-upfront cost UL-certified US patented retrofit products with rapid simple payback; Free training, tools, and methods to market, sell, install, and support our solutions for partners; and Significant and compelling energy efficiency benefits. The "You Get" section lists: More PM annual contracts; Net new customers; Increased revenue, including during the slow season; and Brand differentiation. A URL <https://www.coolgreenpower.com/technology> is visible at the bottom left of the screenshot. A chat icon is in the bottom right corner.

<https://www.coolgreenpower.com/technology>



We Offer

- ✔ Low-upfront cost UL-certified US patented retrofit products with rapid simple payback
- ✔ Free training, tools, and methods to market, sell, install, and support our solutions for partners
- ✔ Significant and compelling energy efficiency benefits



You Get

- ✔ More PM annual contracts
- ✔ Net new customers
- ✔ Increased revenue, including during the slow season
- ✔ Brand differentiation



Installation and Operations Support COOLNOMIX Installation Manual



COOLNOMIX Air Conditioner Installation Instructions


These instructions supersede those provided in the COOLNOMIX packaging

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Installation and Operations Support COOLNOMIX Connect Instruction Manual

 CoolGreenPower

COOLNOMIX® Connect Instruction Manual Version 1.3
December 2021

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Coolnomix Connect

V1.3 FW:28211124 CLOSE
 AR-01 V5.14 Set57.20F Unit #1

Saving: 0.0%

Devices

Coolnomix
 Device address:F9:98:31:88:F2:CA
 State:Connected

COMPRESSOR ON
COMPRESSOR OFF

GET/STOP REALTIME DATA

MSG

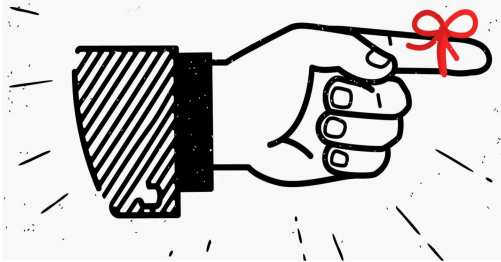
16:39:02 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:39:12 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:39:22 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:39:32 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:39:43 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:39:53 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:40:03 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable
16:40:13 C63.09 R63.58 Mode: A Relay: ON Log:ON Enable

Additional Installation and Operations Support

- Site Survey
- Monitoring Equipment On-Site Support (Paragon Robotics)
- **COOLNOMIX** Installation Videos
- **COOLNOMIX** Installation Training
- On-Demand Phone Support from Protek and CoolGreenPower

What's in it for CUSTOMERS?

HVACR is *Critical* to Improving Energy Efficiency

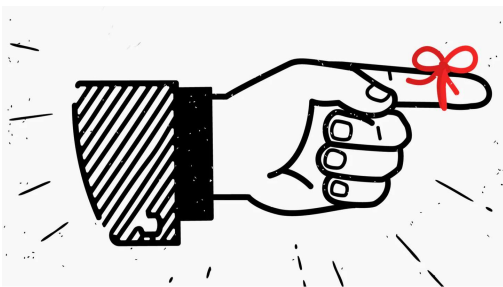


PM with COOLNOMIX helps CUSTOMERS:

1. Reduce Operating Costs
2. **Stop Wasting 30% to 70%** on Cooling / Refrigeration
3. Improve Workplace Comfort / Decreases Food Spoilage
4. Avoid HVACR Downtime
5. Prevent Unexpected Expenses & Crisis Management
6. Reduce Complaints – which Improves Productivity & Customer Experience
7. Increase Equipment Longevity & Lifetime Value ~30%
8. Minimize Equipment Failures
9. Avoid Unnecessary GHG emission
10. Offset Increasing Electricity Rates
11. Save on Labor Rates

What's in it for Installers & Service Providers?

HVACR is *Critical* to Improving Energy Efficiency



PM with **COOLNOMIX** helps **YOU**:

1. Generate New Revenue
 - A. Increase Customer Spend
 - B. Work During Off-peak Months
2. Attract New customers
3. Reduce Emergency Calls and Crisis Management
4. Help Existing Customers
5. Attract & Retain Quality Employees
6. Increase Utilization of Tech Resources
7. Support Customers Dealing with Covid by Increasing Outdoor Air Ventilation at the Lowest Cost

Key Takeaways

- **COOLNOMIX** combined with **Preventive Maintenance** – a great opportunity for both HVAC contractors and your customers
- The NYSERDA **COOLNOMIX** demonstration project budget provides full funding for both HVAC contractors and customer costs
- HVAC Contractors will get to use the latest Bluetooth HVAC tools to perform their work on the NYSERDA **COOLNOMIX** demonstration project, learning new skills
- PROTEK and CoolGreenPower are available to support you with whatever you need to participate in this opportunity

Wrap-Up

- Questions
- Survey
- Thank You