National Comfort Institute, Inc.

hvactoday.com MARCH 2026

HIGH-PERFORMANCE HVAC TODAY™

If You Don't Measure, You're Just Guessing!™

PERFORMANCE

ALSO IN THIS ISSUE:

- Anthony Woo on How Home Performance and HVAC Testing Changed Everything
- Nate Copeland Explains How to Build a High-Performance HVAC™ Culture
- Mitch Bailey Teaches You How to Properly Size Heat Pumps

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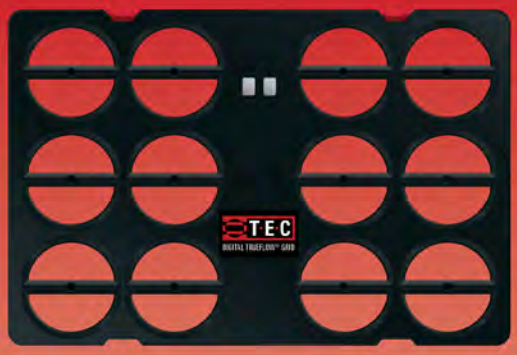
of Building Perfomance Excellence



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THE ENERGY CONSERVATORY

Making it Easier to Do it Right™

National Comfort Institute, Inc.

MARCH 2026 VOLUME 3 NUMBER 10

HIGH-PERFORMANCE HVAC TODAY™

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How Home Performance and HVAC Testing are Changing My Company

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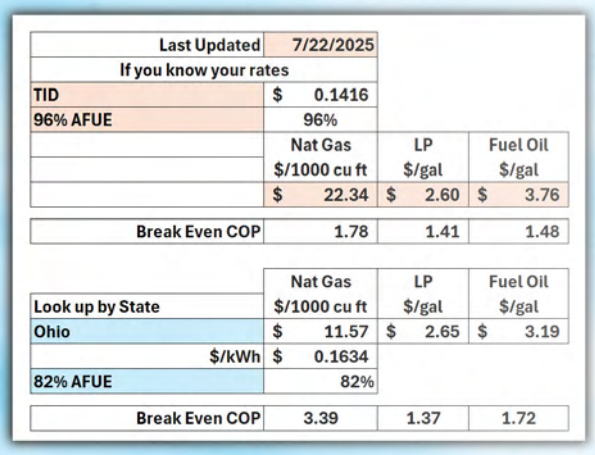
MANAGEMENT:

Why You Should Build a High-Performance HVAC Culture

For HVAC Contractor Nate Copeland, high performance is the heartbeat of his company. He explains why and advises how you can make it so for your company too.



Last Updated	7/22/2025		
If you know your rates			
TID	$ 0.1416		
96% AFUE	96%		
	Nat Gas $/1000 cu ft	LP $/gal	Fuel Oil $/gal
	$ 22.34	$ 2.60	$ 3.76
Break Even COP	1.78	1.41	1.48
Look up by State	Nat Gas $/1000 cu ft	LP $/gal	Fuel Oil $/gal
Ohio	$ 11.57	$ 2.65	$ 3.19
$/kWh	$ 0.1634		
82% AFUE	82%		
Break Even COP	3.39	1.37	1.72

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TECHNICAL:

Sizing Heat Pumps by Balance Points, Bin Data, and Break-Even COP

"Everything starts with a proper load calculation," says Contractor Mitch Bailey. Then the "Three Bs" become powerful tools and not just guesses.

DEPARTMENTS

By Mike Weil

So How Do You Define an HVAC Emergency Anyway?

Mike Weil is editor-in-chief and director of communications and publications at National Comfort Institute, Inc. Contact him at ncilink.com/ContactMe.

HVAC contractors are often called upon to address urgent situations in residential homes. But what truly constitutes an emergency? What should customers expect? How can contractors set themselves apart?

These are questions that occurred to me recently when a very close family member discovered that, after having some much needed repairs to his mechanical equipment, the flue pipe somehow became disconnected. Exhaust fumes containing **Carbon Monoxide (CO)** could have been spewing into his finished basement!

My cousin knew I wrote for an HVAC trade magazine and sent me a picture of what he found. To be honest, I freaked out! I told him to shut off the furnace and open windows to air out the basement. Then I told him to call the contractor and have them come right back out to fix it.

Unbeknownst to me, my cousin decided to temporarily fix the flue pipe himself, ***then*** call the contractor. He fitted the separated pipes together, duct-taped them tightly and then called the contractor's service department.

He was told his repair was good enough until they could come back, which would be in several hours. That was ***very*** unacceptable to me.

It just so happened I know the owner of this company and I called him to tell him what was happening. He immediately made some calls and had his service team back out to the house within an hour.

In the meantime, I ran over to my cousin's house and gave him one of my **NSI 6000 Carbon Monoxide monitors** which showed no CO. Later, after the professional repair, the CO levels remained at zero. Thank goodness.

This scenario certainly raised a bunch of questions for me, so I asked a number of other HVAC contractors their thoughts on what constitutes an emergency.

One respondent, **Anthony Kent of Bassnett Plumbing, Heating, and Air Conditioning** said, "From my perspective, an HVAC emergency is any situation that presents an immediate risk to occupant safety, health, or the integrity of the home, or one that significantly impacts vulnerable populations during extreme conditions."

He and several other contractor respondents pointed out the importance of clear, concise communications between their team and the customer upfront to prevent panic while ensuring true emergencies rise to the top of their priority list.

But what should you do if a customer tries to make a fix themselves like my cousin? Kent says, it's all about communication and training.

"Emergency preparedness must be trained across the entire HVAC team," he says. "Dispatchers need to recognize red flags and ask the right questions. Technicians must be trained in safety protocols, diagnostics under pressure, and communication during stressful situations.

"Emergencies aren't just technical events — they're human events — and training has to reflect that," Kent says.

So if an emergency like CO spills, system failure during extreme temperatures, and other issues happen, no one should think a DIY repair by the customer means they can take their time getting there for the fix.

Plus, in my opinion, such situations shouldn't need to be elevated to the owner to move things to the top of the priority list.

What are your thoughts on this question? Let me know at **ncilink.com/ContactMe**.

Written by HVAC Professionals for HVAC Professionals

FIELDPIECE SMAN 482V DIGITAL MANIFOLD

The Fieldpiece SMAN 482V is a well-thought-out evolution of the digital manifold. It is not a reinvention, but a refinement of tools and workflows technicians already rely on. Nothing about this manifold feels gimmicky. Instead, its design makes proven best practices easier to execute consistently in the field.

Features like the built-in micron gauge and 3/8-in. vacuum ports aren't new concepts, but their integration matters. Having vacuum measurements built directly into the manifold simplifies setup, reduces extra connections, and supports cleaner evacuations and recovery when paired with proper hose practices.

The workflows encourage technicians to verify evacuation quality rather than

assume the job is done.

The SMAN 482V also shines during pressure testing. Its temperature-compensated nitrogen pressure test helps account for ambient temperature changes, reducing false pressure drops that can lead to unnecessary troubleshooting or callbacks. That's a confidence builder feature that saves time and frustration, especially on longer tests.

From a durability standpoint, this tool is ready for real job-site conditions. The construction is rugged and water-resistant, valves are solid and durable, and buttons are easy to use — even with gloves. The display is clean and readable, without overwhelming the user with clutter.

Where the SMAN 482V shines is in its connectivity. Data logging allows technicians to track refrigerant performance over time, and integration with JobLink system tools pulls pressure, temperature, airflow, and refrigerant scales into one place. That makes diagnostics clearer, documentation easier, and decisions more confident.

Overall, the SMAN 482V isn't about flashy upgrades; it's about supporting accurate diagnostics and professional-level work. Learn more at the Fieldpiece website.

— by Casey Contreras, NCI Instructor

By Mike Weil

High-Performance HVAC™ Legacy *of a Small Contractor*

High-Performance HVAC™ contracting often conjures images of sophisticated equipment installations, advanced diagnostic tools and training, and large, well-staffed firms with the resources to test, measure, and document everything they do.

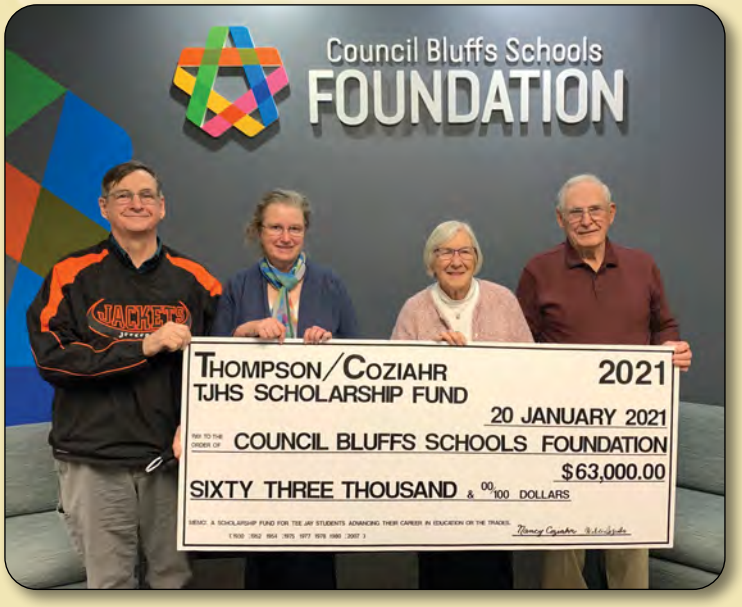
However, the truth is that some of the most innovative and precise work in our industry is also being done by small contracting firms, with craftspeople who view every job as both a challenge and an opportunity to create something exceptional.

Few embody that spirit better than Dave Coziahr, owner of a very small HVAC company, whose dedication to precision and craftsmanship dates back three generations. Dave's story is a reminder that "high performance" isn't defined by company size or technology. It's about a mindset — one rooted in curiosity, care, and the kind of pride that never cuts corners.

HUMBLE BEGINNINGS DURING HARD TIMES

In 1936 — at the height of the Great Depression — most families were trying to keep food on the table. Jobs were scarce, pay was small, and sacrifice was a part of daily life.

For many, the idea of starting a business during those lean years would have been unthinkable. But for Walter Coziahr Sr., working for someone else who didn't pay him for all the hours he put in was unacceptable, so he quit and started his own HVAC company.



The TJ scholarship photo (from left to right) includes David Coziahr, his wife and co-owner Luanne, and David's mother Nancy and father Walter.

In those early days, Coziahr was known for grit, adaptability, and craftsmanship. Dave Coziahr's father, Walter Jr., began working in the company when he turned sixteen in the 1950s. After serving in the Army during the Korean War era, he returned home in 1959, ready to enter the family business full-time.

Then tragedy struck. Walter Sr. passed away suddenly, and at the age of 26, Walter Jr. found himself running the company.

Industry friends — mostly World War II veterans — took him under their wing. Over the next four decades, he built a reputation not only as a contractor but also as an active educator and trade leader, working with National Warm Air, ASHRAE, and contractor groups across the Midwest.

"We brought in seminars, brought in estimating experts like Fails Institute, and helped grow dealer education," he says with pride.

Walter Jr. retired in 1999. But long before he stepped aside, he made a promise to himself to make Dave an equal partner.

Says David, "Dad trusted me to make decisions. He'd discuss things with me, but he never overruled me. That gave me the confidence to grow."

CRISIS RESHAPES BUSINESS

Like many HVAC companies in the 1990s and early to mid-2000s, Coziahr was heavily invested in the residential new construction sector. According to David, up to 60% of their work was new construction. When the economy began to slip in 2006, and payments from the general contractors fell so far behind that it crushed

the under $300,000 HVAC company.

David made the painful decision to lay off three of his employees. He says it was at this time that NCI's Rob Falke counseled and helped David to stay the course – which he says was a huge factor in keeping the company's doors open and led to them thriving.

He changed the company's direction from new construction and began building his residential service and replacement business.

A LEGACY BUILT BEFORE HIGH PERFORMANCE HAD A NAME

It's clear that system performance wasn't just a business goal for the Coziahrs — it's a family legacy. Walter Jr. was part of the University of Illinois' early studies on residential HVAC systems, conducted long before the phrase High-Performance HVAC contracting existed.

Those studies, supported by the ***National Warm Air Heating and Air Conditioning Association*** — the organization that eventually evolved into the **Air Conditioning Contractors of America (ACCA)** — were groundbreaking. They sought to understand how real-world HVAC systems performed once installed in homes. In an era when "testing" often meant holding your hand over a register to see if it felt warm, this measured, data-driven approach was decades ahead of its time.

Dave's father participated in that research, helping to shape the foundation of modern system performance testing. He was, in many ways, practicing high performance long before the industry had a name for it.

"Those guys were doing the real work before any of us knew what high performance meant," Dave says with pride. "I grew up around that mindset — that you don't guess, you prove. You don't assume, you test."

EDUCATION: THE HEART OF THE COZIAHR LEGACY

Training has been a central value of the Coziahr family for nearly 50 years.

In the 1970s, Walter helped introduce trade education into the local school system, including what would later become the local high school's vocational program.

Today, Dave continues that legacy. He says, "We support the **TradeWorks Academy** program here," he says. "It is offered to first and second-year high school students who can explore HVAC, plumbing, welding, electrical, metal fabrication, and auto mechanics.

"Plus, The TradeWorks at IWCC (Iowa Western Community College) is offered to third and fourth-year students, with classes held on the IWCC campus."

THE MAKING OF A CRAFTSMAN

From a young age, Dave says he was fascinated by how systems worked — not just in theory, but in the messy, unpredictable conditions of real homes. His father's influence was both technical and philosophical: you must understand the science, respect the process, and treat every job as if it mattered, because it does.

Today, many customers consider Dave's work to be art. His custom-built filter cabinets, for example, are hand-crafted to perform and to last. He builds them to be beautiful, functional, and modular — so they can be easily disassembled, serviced, and

David Coziahr standing next to his working HVAC system demonstrator holding a Testo manometer during a high school career day event.

even reused. These aren't factory parts or quick fixes; they're tangible proof of a craftsman's care.

"When you see his installations, you can tell he loves what he does," one NCI colleague told me. "Every system looks like it belongs in a showcase, but more importantly, it performs as beautifully as it looks."

In an age where speed and volume often overshadow quality, Dave represents a refreshing contrast. His approach is slow, deliberate, and measurable — an antidote to the "good enough" mentality that plagues too many corners of our trade.

WHEN SMALL MEANS HIGH PERFORMANCE

It's easy to assume that high performance is reserved for large HVAC companies with dedicated testing teams and expensive tools. But contractors like Dave Coziahr prove that's not the case.

His company may be small, but his impact runs deep. Every technician he trains learns to measure pressure, verify airflow, and document results. They learn that high performance isn't a department — it's a discipline.

For Dave, this mindset isn't optional. "We don't have a marketing department or a massive service fleet," he says. "Our reputation is our marketing. Every system we install becomes a living testimonial to how we do business."

This idea captures what many small contractors understand instinctively: you can't hide behind scale. Every mistake shows, every system tells a story. That pressure — the good kind — drives them to operate with extraordinary precision and pride.

THE ROOTS OF MODERN TESTING

The University of Illinois studies that Dave's father participated in were among the first to reveal how differently systems perform in the field compared to in the lab. Those early studies uncovered something our industry is still learning today: that installation quality has as much impact on comfort and efficiency as the equipment itself.

Those early researchers used primitive instruments by today's standards — but their work laid the groundwork for organizations like **National Comfort Institute (NCI)** to develop accessible, accurate testing methods for everyday contractors.

It's a full-circle story. Dave's father helped test the earliest theories of system performance, and decades later, Dave learned to apply those same principles through NCI training.

> **"At Coziahr, they focus on clients who value measured comfort and verified results."**

That continuity — from one generation to the next, from research lab to real home — captures the essence of what NCI calls ***measured performance***. It's about taking something abstract and making it practical, repeatable, and teachable.

FINDING PURPOSE IN PRECISION

One of the hallmarks of Dave's success is his commitment to learning. He has been an NCI member for years and regularly attends the **High-Performance HVAC Summit**, not just to stay current but also to connect with others who share his philosophy.

"Every time I come to Summit," he told me, "I'm reminded that we're part of something bigger — a community that values proof over promises."

That community connection matters, according to Dave, especially for smaller companies like his that often work in isolation. He adds that High-Performance HVAC is demanding work. It requires time, testing, and patience — things that don't always align with quick-turn business models. But as Dave's story shows, it's also incredibly rewarding.

His company doesn't chase every lead. Instead, they focus on clients who value measured comfort and verified results. That selective approach allows Coziahr to maintain both craftsmanship and profitability — a balance many in the trade strive for, but few achieve.

LEGACY, REDEFINED

Perhaps the most potent element of Dave's story is how it bridges generations. His father's legacy isn't just about technical knowledge — it's about a way of thinking. It's about doing work you can stand behind, and teaching others to do the same.

Walter Coziahr Jr. is still alive today, able to see how those early lessons continue to shape the industry. That living connection — from the pioneers of building performance to today's high-performance practitioners — is rare and inspiring.

When I asked Dave what legacy means to him, he paused before

answering. “It’s about taking what you were given and making it better,” he said. “My dad gave me a foundation, NCI gave me the tools, and now it’s my turn to pass that on.”

In that one sentence lies the heart of high-performance contracting — not just better systems, but better people, carrying forward a standard that transcends time and technology.

LESSONS LEARNED

For every small contractor reading this, Dave’s journey offers a roadmap. You don’t need a huge team or a high-end lab to deliver measurable performance. You just need the will to test, the curiosity to learn, and the pride to keep improving.

High performance isn’t about having the newest tool or the biggest truck. It’s about consistency. It’s about treating every job like it’s being graded — because in many ways, it is.

As Dave says, “Our work isn’t just to heat and cool spaces. It shapes health, safety, and comfort for the people who live in those spaces.

“When we measure, verify, and teach those values to the next generation, we build something far more lasting than a business — we create a legacy.

Dave says he believes the future of HVAC is brighter than ever.

“The profession used to be narrow,” he says. “Now it’s broad. You can specialize in duct design, controls, residential, commercial, medical systems — whatever excites you.

“But one truth carries across all areas. Everything inside the home works together, or everything fails together,” he explains. “Understanding airflow, comfort, energy use, and system performance—that’s what sets a high-performance contractor apart.”

SMALL CONTRACTORS MATTER

As the high-performance movement continues to grow, let’s remember where it began: in the hands of small contractors who believed in doing things right. If you’re one of them, take time to review your testing process. Invest in training. Mentor someone new. Share what you’ve learned.

Because as Dave Coziahr’s story shows, performance isn’t just about technology — it’s about legacy. And legacy starts with you.

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PODCAST OF THE MONTH

The Combustion Chronicles *with Jim Davis*

When it comes to combustion efficiency, **Jim Davis** may very well be the foremost expert in the entire HVAC Industry. In this podcast, NCI's **Adam Mufich** and **David Richardson** talk with Jim about his life, his experiences, and what led him (and this industry) to where we are today.

During this interview, Jim takes you through the real-world experiences that led him to uncover what actually affects **combustion efficiency**.

Along the way, he challenges common trade myths and simplifies the basics of heat transfer, showing how they play a critical role in combustion.

"In the 1970s, the world wasn't really focused on carbon monoxide (CO)," Jim explains. " Energy was the big issue. The Arab Oil Embargos led to soaring costs to heat and cool homes."

In this podcast, Jim, Adam, and David discuss what led to the development of combustion analyzers and how that started Jim down the path of questioning how they worked, how they impacted efficiency, and how combustion efficiency impacted CO.

Then Jim discusses the concept of rising CO measurements and how that changed everything once again.

Click here to listen to this important podcast.

Catch these and Other Episodes at HVACToday.com/Podcast

When Duct Leakage Matters

Not all duct leakage is created equal. **Steve Rogers** from The Energy Conservatory explains the critical differences between leakage inside and outside the thermal envelope and how each affects comfort, efficiency, and performance. In this podcast, moderated by NCI's **Adam Mufich**, Steve also dives into diagnostic testing strategies that help uncover the real sources of airflow and comfort issues.

The Future of Design with Tony Amadio

National Comfort Institute Instructor **Adam Mufich** sits down with **Tony Amadio**, president of First Dimension Software and the developer of TrueLoads, a residential HVAC system design application. In this podcast, Adam and Tony talk about the different methods of doing load calculations. They discuss the pros and cons of the various software platforms and the need for always seeking more accuracy.

Behind the Measurements: Air Balancing with Scott Fielder

This High-Performance HVAC™ podcast has National Comfort Institute Instructor **Adam Mufich** sitting down with **Scott Fielder** from Evergreen Telemetry for a conversation about commercial air balancing, field measurement, and the stories behind Evergreen's innovative tools.

A Deep Dive with Ed Janowiak (ACCA's Manager of HVAC Design Education)

Ed Janowiak joins **Adam Mufich** to discuss Ed's journey of measuring heat pump performance. Ed shares the challenges in performing airflow and Btu calculations. He and Adam also discuss practical ways to measure the coefficient of performance and conduct quick diagnostic tests that can provide valuable insights into HVAC system health. Whether you are an industry veteran or just getting started, this conversation will have meaning and value to you.

One Year in the Life of a High-Performance HVAC Contractor™

Contractor **Anthony Woo** shares with our podcasting audience how he first connected with NCI, the impact it's had on his professional journey, and the lessons he's learned over the past year. From new skills to real-world successes, this conversation highlights how training and education can transform not just a career, but an entire approach to residential HVAC.

Listen or watch wherever you find your podcasts or visit HVACToday.com/Podcast

By Anthony Woo

Home Performance & HVAC Testing *Are Transforming My Company*

I run a growing residential HVAC company in Montreal, Canada. We're only five years in, and early on I made a decision that changed everything: I decided to build the business around **measured performance** — not brand names, not box swaps, not prices.

That single choice reshaped our sales, seasons, team culture, and our reputation with both homeowners and other contractors.

I didn't come into this with decades of airflow expertise. I'm still learning every day. But once I started investing in training classes with organizations like National Comfort Institute (NCI) and using real testing and measuring instruments on every call, I finally had the **proof** I needed to communicate problems and solutions in a way homeowners could see and trust.

Anthony Woo (second from left) and two members of his team train with National Comfort Institute's Paul Wieboldt (center right) on load calculations and airflow.

WHERE THE PROFITS REALLY ARE: THE RETURN SIDE

If you ask me where **Air Upgrades** deliver the biggest win, I'll point to the **return** every time. On retrofits we repeatedly find the same story: a nice, wide 20×20-in. duct at the trunk shrunk down to 8×10 inches somewhere in the run, then flared back to 20×20 inches at the filter rack.

That choke point is the villain behind a lot of comfort complaints and ECM motor failures, and it's also where we create outsized value for clients and profit for our company.

In my market, most systems have rigid ducts located in basements. So, while we don't do a ton of flex duct fixes, we do a lot of **return drop rebuilds**.

Those jobs are straightforward, repeatable, and high impact: lower static pressures, healthier motors, better comfort.

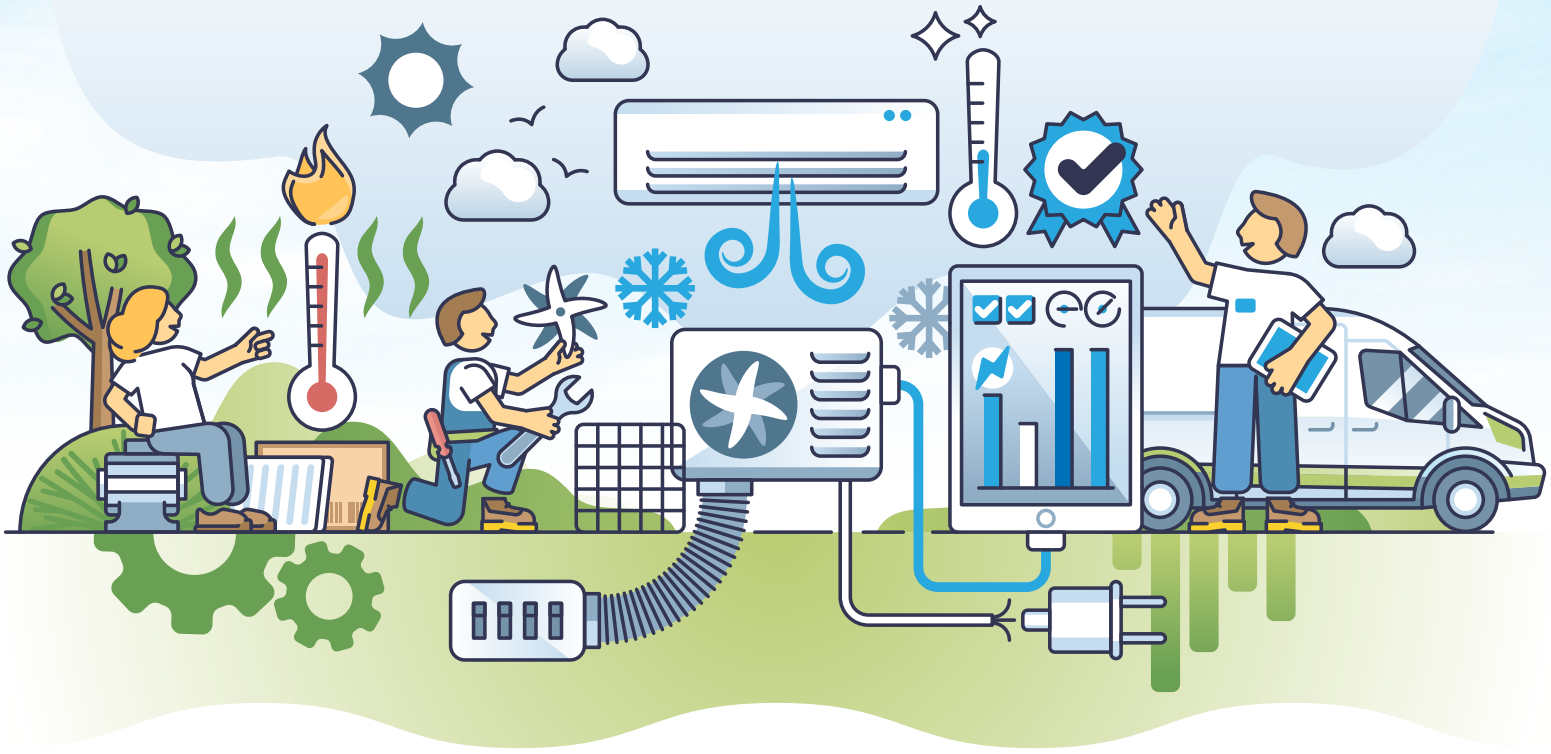
PROOF BUILDS TRUST AND TRUST BUILDS SALES

Our approach is simple: **measure first, explain with visuals, and then prescribe solutions.** I bring The Energy Conservatory (TEC) reports and NCI's "blood pressure" chart into every conversation.

When a homeowner sees their return static sitting in the red and then sees the equivalent "stage" on the chart, the light bulb comes on. Suddenly airflow and static aren't abstract — they're real, and they're affecting both comfort and equipment life.

That's when people say, "No one's ever shown me this before," and it naturally leads to the right upgrade scope.

I'll give you a favorite example. A homeowner called after multiple contractors had replaced ECM motors twice in four years. Now the third motor failed. We measured airflow and found the filter rack and return were way too tight.



We then re-engineered the return drop, and retested. Static pressure dropped, the system stabilized, and the homeowner finally got the reliability they paid for. That was my first "WOW" moment with high performance testing and it set the tone for everything we've done since.

SMOOTHING THE SEASONS: TURNING "HIGH & LOW" INTO "HIGH & NORMAL"

One underrated benefit of Air Upgrades is timing. They're almost never emergencies. That gives us **the ability to schedule indoor return work and IAQ (indoor air quality) improvements** during our brutal Canadian winters. Outdoor temperatures of minus 40°C are not unusual.

Drastically reducing emergencies keeps our install crew productive when outdoor installs would be miserable or delayed.

Practically, that means our calendar rides between 50 to 60-hour weeks in peak and steady 40s in shoulder seasons, instead of whip-lashing between "slammed" and "starved."

FROM CALLS TO CONSULTS: HOW TESTING CREATES LEADS

Ninety percent of our leads are self generated. We don't run billboards, we had zero marketing budget for years, and even today we keep it lean — Facebook, Google, and a website, mostly to make it easy for people to find us after they hear about what we do. The reason it works is that **testing finds invisible problems** other contractors don't uncover.

When you fix those issues, people talk. Additionally, manufacturers and supply houses send us their "unsolvable" cases because they know we'll measure, document, and close the loop.

OPERATIONAL WINS

Before we began High-Performance HVAC™ training with NCI, we were already rebuilding a lot of returns, but I'll admit it was partly out of convenience and standardization.

The difference now is we know exactly why a system is struggling — and we can prove it.

With airflow grids and static pressure testing, we've shifted from symptom chasing (like repeated ECM swaps) to **true root cause fixes**. Callbacks drop when the diagnosis is right and the system is verified after the work is finished.

TRAINING ISN'T A LINE ITEM — IT'S OUR OPERATING SYSTEM

I have a simple rule: **If my team is in a class, I'm in that class**. It keeps our methods aligned with what we expect in the field, and it prevents the "training vs. company process"

conflict that can happen when only techs attend.

We also invest in real certifications, not just internal demos. I want my people to own credentials in their names. It builds pride, career paths, and a culture of mastery.

As we grow, we're bringing trainers to Montreal so we can "upskill" the entire group together.

Our culture rests on empowerment and personal development. I regularly **review each team member's 1, 3, 5, and 10 year goals** and help connect the dots between earnings targets and the skills, certifications, and revenue production that make those targets real. My job is to build the best versions of the people who chose to trust me with their careers.

RECRUITING THE RIGHT WAY: MAKE LEARNING THE MAGNET

I've never hired someone off a resume. Every person who joined us first reached out after seeing our work, our tools, and our training culture on social media or in the community. High performance attracts high performers, especially techs who feel stuck in environments where airflow and testing aren't taught.

When they see we take measurements seriously, they want in. That's been our best recruiting engine by far.

COMPETING ON VALUE, NOT PRICE

I'm upfront with homeowners: we're ***not*** the cheapest contractor in the area. I even give price ranges before I arrive. It saves time for everyone and attracts people who value solutions over low bids.

During sales calls, I measure static and airflow, lay out the numbers, and explain why a specific scope (like a return rebuild, proper filtration, surge protection, commissioning) is the right fit. A common reaction is, "The last five guys didn't do any of this."

Exactly. We're not here to sell a box. We're here to deliver comfort, reliability, and verifiable performance.

And if someone chooses a cheaper route elsewhere, that's okay. Some of those homeowners call back a few years later when the problems persist or get worse. By then, they're ready for data and durable solutions.

COLLABORATION HAPPENS AT THE TOP

I believe there's plenty of work for everyone, and I practice what I preach. We partner with specialists for duct cleaning and envelope sealing instead of pretending we're the masters of everything. We also help local contractors solve airflow and static issues on their installs — on their behalf — because it raises the bar for the whole market.

When we all get better, homeowners

Eight Key Takeaways to Remember

1. Measure First — Always. Static pressure, airflow, temperature rise/fall… these numbers tell the story. Homeowners trust what they can see, and measurements transform every call from guesswork to clarity.

2. The Return Side Is Your Hidden Profit Center. Most of the serious airflow restrictions we find are on the return. Fixing that first solves comfort issues, protects ECM motors, and builds real value for clients.

3. Air Upgrades Create Off Season Stability. Because they're rarely emergencies, Air Upgrades fill winter schedules, keep your team working inside, and flatten the highs and lows of seasonal demand.

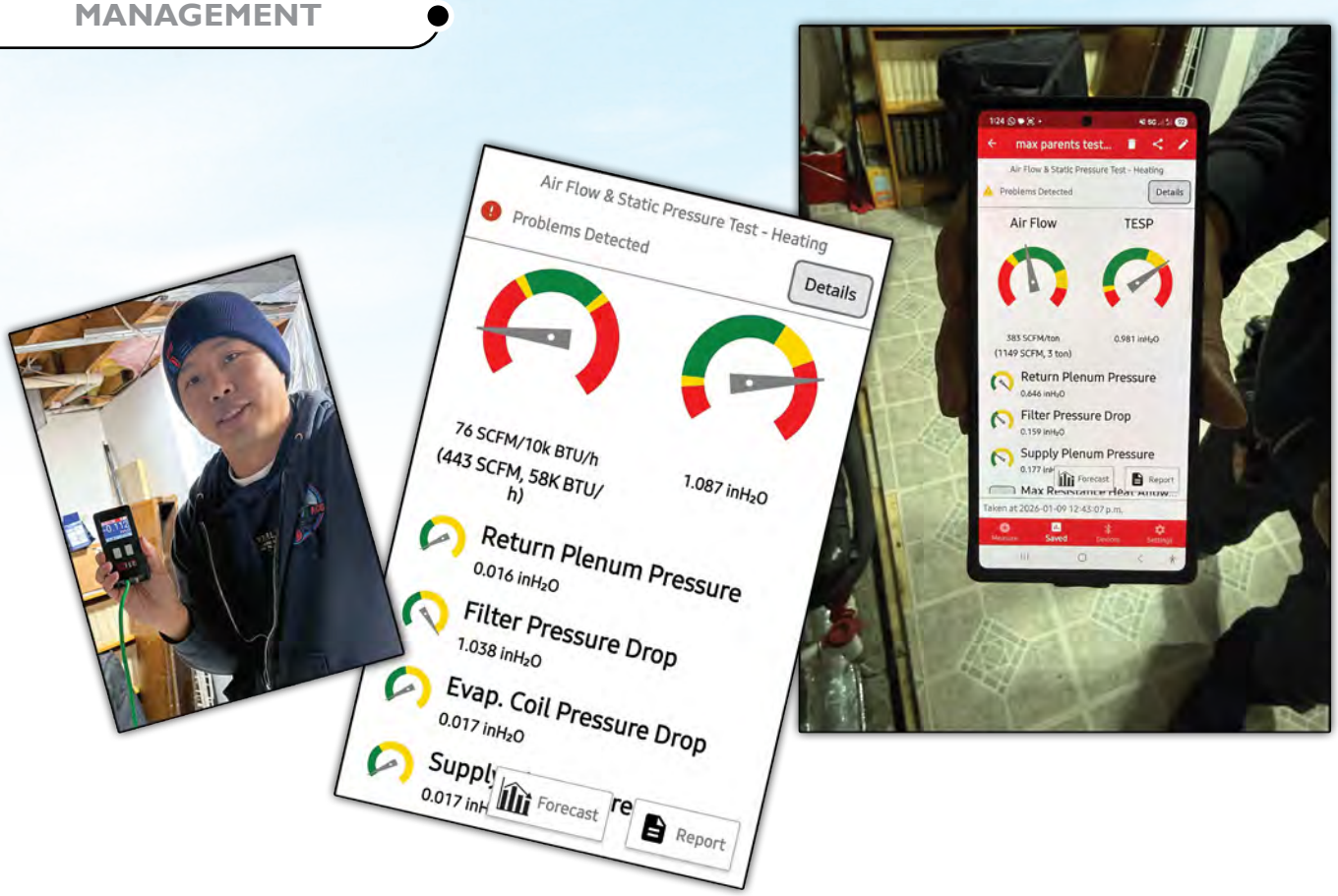
4. High Performance Work Generates Its Own Leads. When you solve "unsolvable" problems, customers talk — and so do manufacturers, supply houses, and even other contractors. That creates high quality referral streams with zero marketing spend.

5. Invest in Training and Go With Your Team. When you attend the same classes your techs take, you align your processes, set shared expectations, and build a culture that attracts top talent who want to learn and grow.

6. Don't Compete on Price — Compete on Proof. If you want to be the cheapest, you have to cut corners. If you want to be the most trusted, you have to measure. Show homeowners the numbers and they'll understand the value.

7. Collaboration Beats Competition. Partnering with specialists—duct cleaning, envelope sealing, building science—elevates your offerings and strengthens your local market. Everyone wins when everyone improves.

8. Teach Homeowners, Don't Sell to Them. Share the "why" behind the upgrades. When customers understand their system's pressures, temperatures, and airflow, they stop seeing you as a salesperson and start seeing you as a trusted advisor.



win, reputations improve, and the industry moves forward.

EDUCATION FIRST: ONLINE AND IN HOME

On Facebook I share short, homeowner friendly videos that highlight filter basics, how to use an air exchanger, and why static matters. It keeps me accountable and builds awareness before I ever step into a home.

On site, I involve homeowners in the process: we walk the system, review thermal images, look at pressures, and talk about what the numbers mean. When a project needs specialists, I make the introductions and stay in the loop, so the solution is complete.

THE MOMENT IT CLICKED AND WHAT CAME NEXT

My very first airflow optimization project sold before I even took the course. It was a leap of faith backed by a community of mentors. I collected the data, consulted with experienced pros, and then executed a scope that made the numbers move the way they should.

That one success showed me how powerful the high-performance approach really is and gave me the confidence to keep going.

Since then, I've challenged myself beyond the field — speaking on panels, sharing what I'm learning, mentoring newer contractors.

Ironically, the thing I'm most recognized for these days isn't just the technical work; it's **the way we run the business — through training, data, and collaboration**. That wasn't the plan when I started, but it became our identity.

WHAT EVERY CONTRACTOR SHOULD KNOW

A high-performance approach isn't an expense — it's an investment that pays you back in trust, profit, team retention, and market reputation. Start by measuring what matters. Show homeowners the numbers. Train your people and give them credentials they can be proud of.

Don't be afraid to partner where it makes sense. And don't avoid trying to raise the bar in your market. When you do, the right customers and the right teammates will find you. NCI

Anthony Woo and his partner Kar Young Tom own Climatisation ACG, located in Montreal, Canada. This young company first opened for business in 2022 and under Woo's leadership has practically doubled its gross revenues year after year. Anthony adopted the High-Performance HVAC™ way and is steering his company toward solving invisible problems that most of his competitors know nothing about. The company was featured in ***High-Performance HVAC Today*** as a Contractor Spotlight in 2025. To contact Anthony, go to ncilink.com/contactme.

By Nathan Copeland

Building a High-Performance **HVAC Culture**

When people ask me what a high-performance culture is, I tell them it is the heartbeat of our company. Because I've been doing High-Performance HVAC™ work since 2004, the mindset becomes instinctive. You stop thinking of airflow testing or static pressure diagnostics as "extra steps" and start seeing them as the only honest way to do this work.

Over time, those habits form the DNA that guides every decision you make.

Whenever we hire new technicians who have spent their careers in traditional shops, I'm reminded how unusual the High-Performance HVAC approach still is.

Some of these techs start with us having never seen a static pressure reading or a combustion analysis.

When they finally understand how much information they've been missing, you can see the revelation on their faces. It validates why we do things the way we do.

Our culture didn't develop overnight. It started with my grandfather, who built this company on the belief that if you lose your integrity, you've lost everything.

My father carried that same belief when he eventually took over, and now that I'm leading the company under our updated name — **Copeland Home Services** — that commitment to integrity remains the foundation.

When we combine that with the technical philosophy of National Comfort Institute (NCI), we get a culture defined by transparency, accuracy, accountability, and the courage to do the right thing even when it is harder or slower.

At many companies, you can ***trip*** over their standards. At ours, you can ***hit your head on them*** — and we keep them high for a reason.

BUILDING PEOPLE AND PERFORMANCE THROUGH TRAINING

In my opinion, a high-performance culture can't exist without a strong commitment to teaching and developing people.

Training isn't something we squeeze in when there's time; it is baked into our weekly rhythm. Every Tuesday and Thursday morning at 7 a.m., our technicians gather to go over topics ranging from static pressure and airflow diagnostics to sales communication, building science concepts, and customer interactions, along with basic technical knowledge.

The most rewarding part is seeing the culture spread organically within the team. When technicians begin discussing airflow issues among themselves or sharing **measureQuick®** numbers from jobs without being asked, it shows that our principles have taken root. The process stops feeling like training and becomes part of their identity as professionals.

Changing habits is one of the biggest challenges. Many technicians with years of experience have never tested a system in their lives. They are

used to swapping boxes and moving on.

When we bring someone new into the fold, we look less at their résumé and more at their willingness to learn. A technician with curiosity, humility, mechanical aptitude, and good communication skills is far more valuable than someone resistant to change.

We don't maintain rigid, formal career ladders, but there is an informal progression that works for us very well. Technicians usually start with installation, where they learn the fundamentals.

From there they move into maintenance, and eventually they grow into service roles that require deeper diagnostic and high-performance thinking.

The growth is easy to see, especially when a technician finishes a new install, runs a commissioning report, and sees a measureQuick score above 90%. They light up. That sense of pride reinforces everything we're trying to build.

RECRUITING AND RETAINING THE RIGHT PEOPLE

Recruiting the right people is essential to maintaining our culture. Our company has grown rapidly — **from $1.2 million to $4.38 million in a single year**. That kind of growth forces you to be intentional about who you bring onto the team. We hire people who are willing to buy into a performance mindset, who value honesty, and who want to be part of a team that holds itself accountable.

Our service manager Steve Jones, who has deep experience in both plumbing and HVAC, conducts most of the interviews. He is also an NCI guy! He asks questions that reveal whether candidates understand — or are at least open to understanding — performance testing.

One thing that's even more important than technical knowledge is a candidate's attitude. We watch for signs of genuine curiosity, a willingness to be coached, and the ability to communicate well with customers.

Many techs claim they do combustion testing or airflow diagnostics, but when questioned further, they often cannot interpret the numbers. That tells us everything we need to know.

Furthermore, we offer strong benefits, including 100% family medical coverage regardless of family size and a six percent 401(k) match.

Those benefits certainly help attract people, but they don't guarantee a good cultural fit.

During onboarding, the entire team observes new hires and provides feedback to leadership. It's not about hazing — it's about protecting an environment we've worked hard to build.

When someone resists accountability or isolates themselves, it quickly becomes clear that they're not aligned with our values.

But when someone leans in, participates, asks questions, and embraces the testing mindset, they fit right in.

We truly have an amazing team.

COMMUNICATION, ACCOUNTABILITY & LEADERSHIP

High-Performance HVAC work requires constant communication. Before any installation job, I perform load calculations through **Conduit Tech** and run a **measureQuick test** to establish the baseline performance. I then share every detail with the installation team so they know exactly what they're walking into.

For more complex projects, I meet our installers on site to walk through my findings and set clear expectations based on what the customer needs and what the home's structure demands.

After completing an installation, the technicians run new measureQuick reports to verify performance improvements. If something is off, we talk about it immediately.

Accountability doesn't mean blame; it means using the numbers to guide improvement.

Teams sometimes revert to old habits from previous jobs, especially when they feel rushed. That's when leadership matters most. My job is to bring them back — not by scolding, but by reinforcing why the process matters.

I find that it's best to lead by example. I'm now the oldest person who works here, and the team watches how I do everything. If they see me taking shortcuts, they will follow. If they see me doing post testing, documenting findings carefully, and refusing to compromise, they follow that too.

For me, leadership isn't about what you tell people it's about what you consistently demonstrate.

SYSTEMS, MEASUREMENT, AND STANDARDS

A high-performance culture depends on measurable outcomes. Data keeps everyone honest and removes guesswork from the equation. We rely heavily on tests that reveal a system's true health: airflow readings, temperature differentials, combustion analysis, static pressure, and refrigerant measurements.

Again, measureQuick plays a major role in our workflow with the objective of achieving a score of 90% or higher. There are occasional situations — like cramped closets or immovable equipment — where perfection isn't possible. But even in these scenarios we focus on making the system better than it was, then we explain the realities to the customer with complete transparency.

Some of the most dramatic "aha" moments happen in the installation department. Technicians often perform baseline readings that show a system performing at a poor level.

After they make duct improvements, adjust static pressure, or correct airflow problems, the final **commissioning test** might show a score above 90 or even 100. When they see that improvement, they see the value of the testing which gives technicians a deep sense of ownership.

Then they begin to understand that they didn't just install equipment, they solved a problem.

CULTURE, CUSTOMER EXPERIENCE & BRAND

Our culture is probably most visible in how we serve our customers. When I walk into a home — especially homes where people are dealing with **health issues related to air quality** — I lay out the facts like an attorney presenting a case.

I show the system's data plate and compare it to the realtime readings I'm collecting. **This isn't my opinion; it's objective information from third-party tools**.

By the way, we work with environmentalists, mold remediation companies, and biologists. All of these partnerships have grown by leaps and bounds. These specialists often go into a home first, run their tests, and then call us to look at the HVAC side of the problem.

It's not unusual to see mold growth or air quality issues that correlate directly with system performance. When customers see their lab results and our performance tests side by side, the situation becomes clear — and they trust us to fix it.

This approach earns us tremendous word of mouth referrals. Customers leave reviews mentioning the precision of our work, the level of communication, and the improvements they feel in their homes. That kind of customer experience is impossible without a strong internal culture.

SUSTAINABILITY AND LONG-TERM GROWTH

As we continue to grow, preserving the culture becomes the top priority. **A company can scale financially and collapse culturally** if leadership isn't aligned. The future will depend on ensuring that the managers and leaders at the top remain deeply committed to high performance principles. If the leadership team believes in the process, it will continue to cascade down through every department.

Looking ahead, technology will continue to shape our industry. App-based

diagnostics, AI-assisted tools, and advanced load calculation platforms are expanding rapidly. These tools can make us more efficient, but they also pose a risk.

If future technicians rely too much on AI instead of learning the underlying fundamentals, they may freeze when technology fails. The next generation needs both — the old school knowledge and the new school tools. True high-performance culture relies on a blend of the two.

HIGH-PERFORMANCE HVAC IS CHANGING EVERYTHING

A high-performance culture is not a program or a marketing line, it is a commitment. It means choosing accuracy over convenience, truth over shortcuts, and longterm trust over quick wins. It means building people through training, holding them accountable with data, and empowering them with the confidence that comes from measurable success.

Most importantly, it means remembering that our work affects people's homes, health, and comfort. When you commit to doing things the right way, you don't just repair HVAC systems: you improve lives.

If you're trying to build a high-performance culture in your own HVAC company, start with integrity, invest in your people, hold firm to your standards, and lead by example. When you do that consistently, the culture will take care of itself. NCI

Nathan Copeland is the third-generation under Copeland Home Services brand, and fourth generation in the industry, a residential High-Performance HVAC, plumbing, and IAQ company headquartered in Franklin, TN. He has worked as an HVAC technician/comfort advisor for nearly 25 years. Nathan holds National Comfort Institute's (NCI) certification in carbon monoxide and combustion and is certified in air balancing and was awarded the **NCI David Debian award**. To learn more about his company culture, you can contact him at ncilink.com/ContactMe.

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By Mitch Bailey

Size Heat Pumps By Balance Point, *Bin Data, and Break-Even COP*

Properly sizing a heat pump ideally begins with a **room-by-room load calculation**. This calculation reveals the home's true heating and cooling requirements and guides us toward correct equipment selection.

In mild winter climates like those found in much of California, sizing is often straightforward because the cooling load is typically close to the heating load. But even in these climates, additional factors must be considered to ensure comfort, efficiency, and long-term performance.

In colder climates, these considerations become even more critical. The Three B's — Balance Point, Bin Data, and Break-Even COP — are essential tools for strategizing and properly sizing a heat pump to ensure reliable, economical heating throughout the winter.

Manual S instructs us to size equipment to the cooling load and use supplemental heat when the heating load exceeds the heat pump's capacity. This is where the first of the Three B's comes into play.

Bin Temperature Data

Location: Cincinnati Muni Lun, OH, US

Temp Range	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
75 to 79	627	0	0	9	29	62	120	152	140	86	27	2	0
70 to 74	894	0	1	18	51	107	162	182	180	132	48	12	1
65 to 69	731	4	5	23	61	115	116	88	104	122	63	27	3
60 to 64	811	14	15	48	95	143	85	53	73	119	107	48	11
55 to 59	711	24	28	61	110	106	45	15	25	83	119	66	29
50 to 54	669	34	35	84	107	80	14	1	5	54	121	93	41
45 to 49	698	55	61	108	102	45	4	0	1	26	110	118	68
40 to 44	587	59	73	102	72	15	0	0	0	6	70	105	85
35 to 39	736	131	117	119	54	5	0	0	0	1	47	114	148
30 to 34	609	142	135	86	19	0	0	0	0	0	17	79	131
25 to 29	426	107	103	53	5	0	0	0	0	0	3	42	113
20 to 24	198	68	42	21	0	0	0	0	0	0	0	10	57
15 to 19	129	54	31	8	0	0	0	0	0	0	0	4	32
10 to 14	59	28	15	2	0	0	0	0	0	0	0	0	14
5 to 9	27	14	7	0	0	0	0	0	0	0	0	0	6
0 to 4	11	6	3	0	0	0	0	0	0	0	0	0	2
-5 to -1	6	3	1	0	0	0	0	0	0	0	0	0	2
-10 to -6	2	1	0	0	0	0	0	0	0	0	0	0	1
-15 to -11	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	8760	744	672	744	720	744	720	744	744	720	744	720	744

Here is a sampling of Bin Data for the State of Ohio. This data helps you determine whether you'll need supplemental heat for your heat pump designer whether a dual fuel option is better.

BALANCE POINT

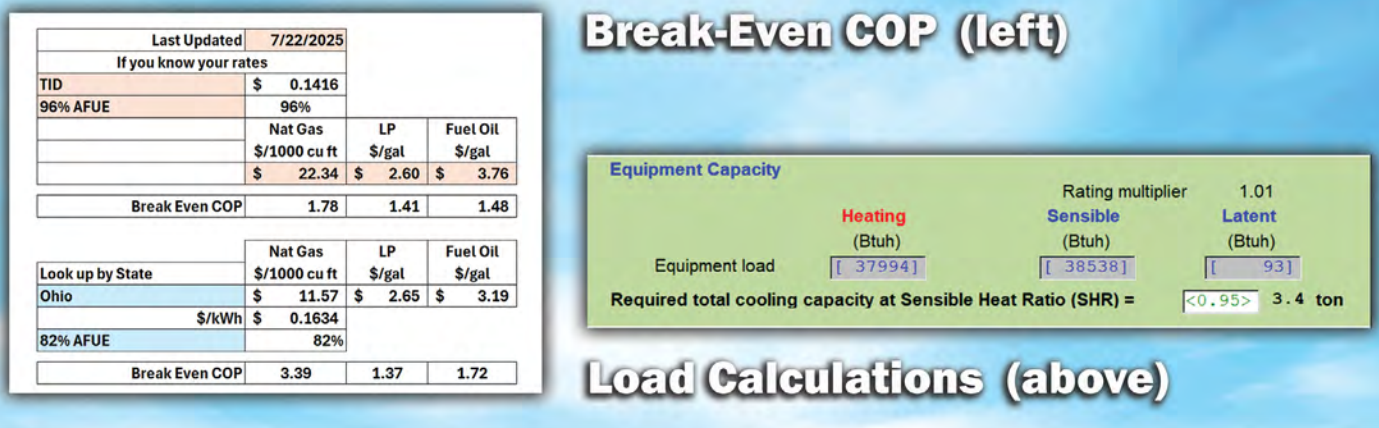
The **balance point** is the outdoor temperature at which the heat pump's heating output matches the home's heat loss. At this temperature, the heat pump runs continuously and maintains the indoor setpoint without assistance.

Any drop in outdoor temperature below the balance point means the heat pump can no longer keep up, and the home will begin to cool unless you provide supplemental heat.

Supplemental heat is therefore essential below the balance point or during defrost cycles to maintain comfort.

A well-constructed home — with good air sealing, quality windows, and adequate insulation — will have a **lower** balance point. Balance point is a core principle of heat pump design: **improve the structure first, then size the equipment**. If the homeowner is unwilling or unable to address significant envelope deficiencies, a heat pump may not be the best solution.

For example, a home built in the 1930s with single-pane wood windows, no wall insulation, a raised foundation with no floor insulation, and minimal attic insulation will have a very high balance point. Such a home may require significantly more heating than cooling capacity. Without improving the envelope, the system may require large supplemental heat strips or be better served by a furnace or a dual-fuel system.



Last Updated	7/22/2025		
If you know your rates			
TID	$ 0.1416		
96% AFUE	96%		
	Nat Gas $/1000 cu ft	LP $/gal	Fuel Oil $/gal
	$ 22.34	$ 2.60	$ 3.76
Break Even COP	1.78	1.41	1.48

Look up by State	Nat Gas $/1000 cu ft	LP $/gal	Fuel Oil $/gal
Ohio	$ 11.57	$ 2.65	$ 3.19
$/kWh	$ 0.1634		
82% AFUE	82%		
Break Even COP	3.39	1.37	1.72

However, we have found that **sealing the envelope and insulating the attic** are relatively inexpensive upgrades that dramatically improve heat pump performance while lowering the balance point.

Climate also plays a major role. A home in coastal California will have a very different balance point profile than a home in the Sierra foothills. Climate leads us to the second "B."

BIN DATA

Once the balance point is known, the next step is to analyze bin data. Bin data is statistical weather information that groups outdoor temperatures (and sometimes humidity) into specific ranges, or "bins," showing how many hours per certain condition occur. You use bin data for calculating building energy use more accurately than simple averages. This information is essential for determining:

- Whether supplemental heat is needed
- How much supplemental heat is required
- Whether dual fuel may be a better option
- How often the heat pump operates below its balance point?

For example, if the balance point is 32°F but the bin data shows only 20 to 40 hours per year ***below*** that temperature, the home may need some supplemental heat. In some climates, heat strips may energize only during defrost cycles.

Because of our mild climate, we rarely install supplemental heat strips on the systems we install. It's simply not necessary.

In addition, we use variable-speed heat pumps that run at low speeds most of the time and thus rarely go into defrost, if at all.

However, if the bin data shows hundreds or even over a thousand hours below the balance point, the heat pump will struggle for long periods. In these cases:

- Supplemental heat will run frequently
- Operating costs may increase
- Comfort may suffer if supplemental heat is undersized
- Dual fuel may be a more cost-effective and reliable solution.

Bin data also helps us size supplemental heat strips correctly. Oversizing strips increases electrical demand and installation cost, while undersizing leads to callbacks and comfort complaints.

Bin data provides the "how often" and "how long" information needed to size supplemental heat intelligently.

Once you have this information, it's time to consider the third "B:"

BREAK-EVEN COP (BECOP)

The **Break-Even COP**, or **BECOP**, introduces the economic side of heat pump operation.

BECOP identifies the outdoor temperature at which it becomes more expensive to run a heat pump than a furnace in a dual-fuel system.

The question you need to ask yourself is:

At what temperature does the furnace become cheaper to operate than the heat pump?

BECOP depends on four factors:

- The home's balance point
- The home's thermal glide (how quickly heat loss increases as temperatures drop)
- The cost of electricity versus gas
- The efficiency of the heat pump at various outdoor temperatures.

If electricity is expensive and gas is inexpensive, the BECOP may be relatively high. If electricity is cheap or the heat pump is highly efficient, the BECOP may be very low.

BECOP allows us to set the dual fuel switchover point based on **operating cost, not guesswork**. When combined with bin data, BECOP becomes a powerful tool.

If the bin data shows many hours below the BECOP temperature, dual fuel may save the homeowner significant money. If there are very few hours below that temperature, the heat pump may be the most economical choice year-round.

BRINGING THE THREE B'S TOGETHER

When we combine the Three B's, we gain a complete, data-driven

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82% AFUE	82%		
Break Even COP	3.39	1.37	1.72

understanding of how a heat pump will perform in a specific home and climate, and at what energy cost.

To summarize:

- **Balance Point** tells us when the heat pump needs help
- **Bin Data** tells us how often the heat pump will need help
- **BECOP** tells us whether that help should come from heat strips or a gas furnace.

This approach moves us well beyond rule-of-thumb sizing and into true system design. It ensures comfort, efficiency, and cost effectiveness while reducing callbacks and improving long-term performance.

THE FOUNDATION: A PROPER LOAD CALCULATION

None of this analysis is possible without an accurate load calculation. Everything begins with understanding the home's proper heating and cooling requirements.

A whole-house load calculation is good, but for real precision and peace of mind, **every home should have a room-by-room load calculation** to ensure:

- Each space receives the airflow it actually needs
- The equipment is sized correctly for both heating and cooling
- The balance point is accurate
- Supplemental heat sizing is correct
- Dual fuel strategies are based on real data, not assumptions.

When we start with proper load calculations, the Three B's become powerful tools rather than educated guesses. It's the difference between installing equipment and designing a system. NCI

Mitch Bailey owns Air Heroes in Modesto, CA. He is a member of ACCA, RSES, and IHACI, and currently holds several NATE certifications, among other qualifications. He is also part of the National Comfort Institute (NCI) training team in California, with more than 49 years of on-the-job experience, and has designed, serviced, and installed thousands of HVAC systems. If you have questions about this article, you can reach Mitch at ncilink.com/ContactMe.

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Residential HVAC System Performance and Air Balancing
March 3-5: Carrollton, TX
March 10-12: Austin, TX
March 10-12: Centennial, CO
March 17-19: Kissimmee, FL
March 24-26: Grand Rapids, MI
April 7-9: Roswell, GA
April 7-9: Troy, MI
April 7-9: Colorado Springs, CO
April 14-16: Tampa, FL
April 21-23: Plymouth, MN
April 28-30: Johnstown, CO
April 28-30: Monroeville, PA
April 12-14: Maple Heights, OH

Commercial Air Balancing
March 3-5: Florence, KY
March 17-19: Oxnard, CA
May 5-7: Richmond, VA
May 19-21: Glen Burnie, MD
May 19-21: Lewisville, TX
May 19-21: Phoenix, AZ

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PUBLIC LIVE TRAINING *(cont.)*

Duct System Optimization and Residential Air Balancing
March 10-12: Appleton, WI
March 10-12: Sacramento, CA
March 17-19: Morristown, TN
March 24-26: Lawnside, NJ
March 24-26: Salt Lake City, UT
April 14-16: Phoenix, AZ
April 28-30: Eagan, MN
May 5-7: Lansing, MI
May 27-29: Las Vegas, NV

Commercial HVAC System Performance
March 24-25: Maple Heights, OH

Airflow Testing & Diagnostics
April 7: Wheeling, IL
April 21: Denver, CO
May 12: Morristown, TN
May 19: Foxborough, MA

Refrigerant-Side Performance
April 22-23: Denver, CO
May 13-14: Morristown, TN
May 20-21: Foxborough, MA

PUBLIC ONLINE LIVE TRAINING

Airflow Testing & Diagnostics *ONLINE LIVE*
March 31 - April 1

PUBLIC ONLINE LIVE TRAINING *(cont.)*

Refrigerant-Side Performance *ONLINE LIVE*
March 31 - April 2

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March 4-5: Tulare, CA
April 28-29: Anaheim, CA

Duct System Optimization and Residential Air Balancing
March 17-19: Anaheim, CA

Commercial Air Balancing
April 7-9: Anaheim, CA

Residential HVAC System Performance Certification Program
April 14-15: Anaheim, CA

The High-Performance Approach to Heat Pump Retrofits
April 16 : Anaheim, CAA

Airflow Testing & Diagnostics
May 5: Anaheim, CA

Refrigerant-Side Performance
May 6-7: Anaheim, CA

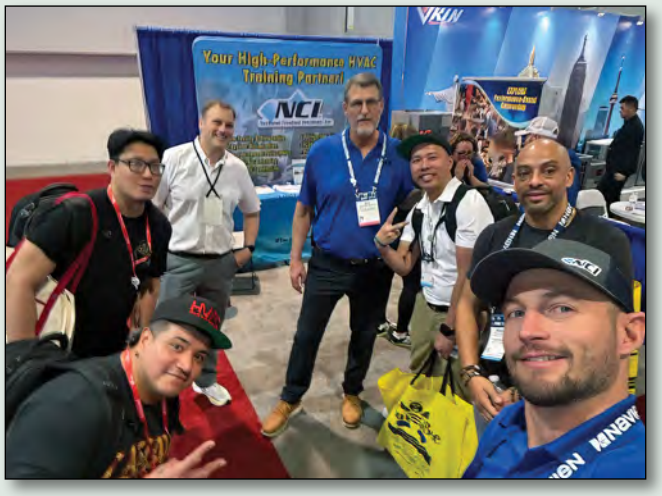
Visit NCIlink.com/ClassSchedule to view the latest schedule.

NCI Makes Big Splash at AHR Expo

The team from National Comfort Institute (NCI) were everywhere during this year's AHR Expo at the Las Vegas Convention Center. Besides having a traditional booth (Booth SL1946) on the show floor, NCI Instructors ran educational seminars, Educational sessions. The team consisted of:

- Ben Lipscomb, P.E.
- Casey Contreras
- David Richardson
- Jeff Sturgeon.

Also, our very own Adam Mufich led a number of podcasts during the AHR Expo.



On the last day of the Expo, student engineers from ASHRAE's youth programming were given a curated tour and panel discussion. HVACR professionals from across the industry came together to talk about career paths, industry entry, and real-world advice for building and sustaining a successful career. Our very own David Richardson wowed students with his tour and presentations.

Many NCI members and other contractors and technicians who have been to High-Performance HVAC training were in Las Vegas and a number stopped by to say hello.

Next year, AHR Expo 2027 will be in Chicago from January 25-27. Registration is expected to open in summer.

interviewed industry powerhouses in the Podcast Pavilion, and presided over prize giveaways in the ***NCI High-Performance HVAC Hangout.***

Overall the Expo attracted 53,315 professionals – including HVAC contractors, engineers, owners, installers, service techs, and more.

Instructors led a number of AHR

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Go to ncilink.com/ContactMe with your comments and questions.

By Dominick Guarino

Differentiate Your Business *with High-Performance Maintenance*

Dominick Guarino is publisher of ***High-Performance HVAC Today*** magazine and CEO of National Comfort Institute, Inc. He can be reached at ncilink.com/ContactMe

I'm guessing you would like to stand out in your marketplace, not just as the go-to contractor for High-Performance HVAC™ retrofits and renovations, but as the preferred ***high-performance service company***.

I'm often asked, "what makes high-performance service different?" My answer is, **Everything**.

Starting from even before entering a home to how you spend your time there, you have a chance to demonstrate your differentiation and value — whether on a demand-service call or maintenance visit.

Everything you do can be different from your competition and you can provide tremendous value for your customers in terms of safety, health, comfort, and energy efficiency.

On demand-service calls, it means doing some additional testing on their system after solving the immediate issue. This might include **measuring static pressures** and delivered airflow, and **checking for proper combustion and carbon monoxide (CO) safety**.

This article could go on for three pages just on how you can apply these principles to demand service calls and ethically increase your average ticket. Unfortunately, I have limited space so I'll save that conversation for another issue.

Let's begin by comparing high-performance maintenance to basic clean and checks.

BASIC CLEAN & CHECKS

Most contractors market "clean and checks" as 18-point inspections (or something like that). These "maintenance" services usually include some visual inspections, and probably some basic temperature readings.

A maintenance visit might include examining and a light cleaning of the condensing unit, and inspecting the contactor, capacitor, etc.

It might include inspecting and replacing the filter, looking for condensate drain issues, flue problems, and visual signs of combustion issues.

While important, this typical service level only gives you a partial picture of what might be going on with their HVAC system.

HIGH-PERFORMANCE MAINTENANCE

On a high-performance maintenance visit, the technician still does all of the above — **but that's where the similarities stop.** High-performance maintenance includes measuring static pressures — typically in four places. Then the technician either interprets airflow through TESP (Total External Static Pressure) or measures it directly at the equipment with a **TrueFlow™** grid.

Additional testing typically includes measuring supply and return air dry and wet bulb temperatures, and checking for CO in the home and around combustion appliances. If you really want to do it right, you should also check draft and CO levels in the equipment flue.

ESTABLISH A BASELINE

The benefits to spending the extra time testing are two-fold: First, you are helping to make sure the home is safe, and the equipment is operating as it should. If it isn't, you can bring the issues to the homeowner's attention and suggest ways to improve things. The improvements can be done all at once, or they can be staged over time.

Second, once everything is working properly, you can establish a performance baseline. On the next visit you can quickly test against these baseline numbers to see if anything has changed.

This approach allows you to include not just the equipment but **the entire air distribution system** in your maintenance agreements.

To continue, click ncilink.com/0326OMT.

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