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KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

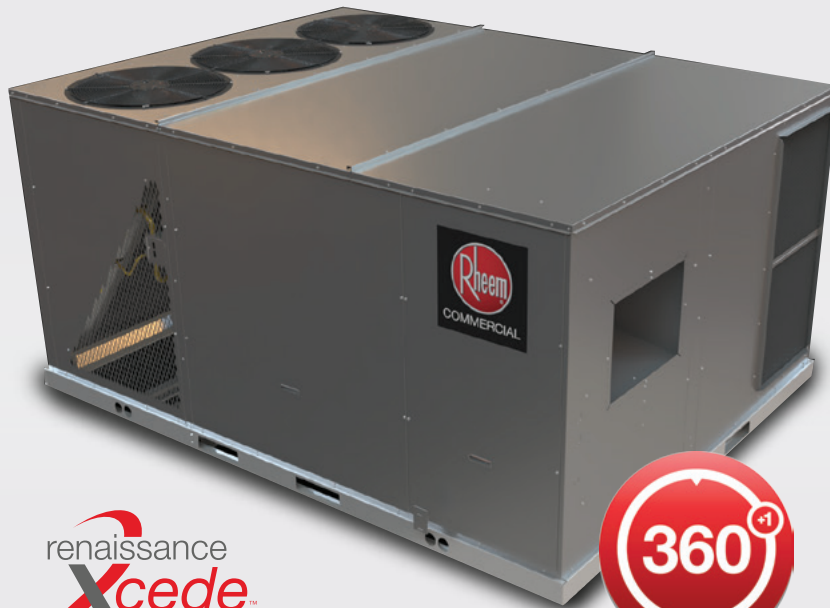
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February 2023

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MERV-13 in
NYC schools
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Enerf Institute*

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HENRIQUE PEREIRA OF TAKA SOLUTIONS SEES
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Engineers*

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Macroeconomic Analysis
*Krishnan Unni Madathil,
Bin Khadim, Radha & Co
Chartered Accountants*

Regulation Round-up
Nabil Shahin, AHRI MENA



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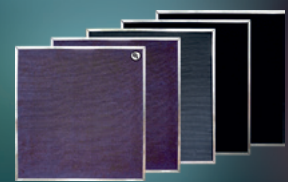


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Surendar Balakrishnan
Editor
@BSurendar_HVACR

Existential issues – and no, they have nothing to do with ChatGPT

The world reportedly needs an estimated USD 5.4 trillion in annual urban climate finance to mitigate climate change. The challenge is a formidable one, but on the ground here in the GCC region – and I suspect in many other parts of the world – the disquietude is not over the multi-trillion-dollar investment that is required but over existential issues.

In the past few weeks, I have informally chatted with MEP consultants and MEP contractors to ascertain the extent of their concern over climate change – let’s call it climate crisis, for it indeed is one. The responses have been quite typical – after the initial soft noises on how important it is to curb runaway emissions, the talk has invariably turned to the availability of projects in the market; an inquisition into the sub-sectors still alive and lucrative; payment delays; marginalising of MEP expertise; lack of coordination amongst the stakeholders, leading to costly budget overruns, delays and finger-pointing; and mild curiosity over those quaint enough to suggest the need for better Indoor Air Quality (IAQ), even if as an afterthought.

Total Cost of Ownership is regarded as an interesting subject, if only to smoothen the worry-lines of facility owners, but even there, it is not hard to sense a certain lack of conviction in the voice, not to forget the gaps that need to be filled yet in the energy services contract model.

Amidst all this is the newest kid on the block – Cooling as a Service (CaaS) – that has arrived with all the fanfare of a Hollywood blockbuster. This month’s issue focuses on the subject through an interview with the CEO of a company that reportedly has made early inroads and gone so deep into providing the service that it is able to describe the application of the model in granular detail, especially after I was at pains to understand how it differs from District Cooling as a model.

In addition to the Q&A on CaaS, we have packed this issue with guest columns that among other aspects, address existential issues, legal points, regulation and rather interesting discussions on building tracing for better IAQ and on air filtration, in particular. Hope you find value for time.



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KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

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Partner, BSA Ahmad Bin Hezeem & Associates LLP, writes on legal affairs pertaining to the construction industry.



Krishnan Unni Madathil
Auditor, Bin Khadim, Radna & Co. Chartered Accountants, carrying out an analysis of the market, writes on business opportunities for the HVACR industry



Jeremy McDonald
Principal of Guth DeConzo Consulting Engineers, in New York. He served as the technical consultant to the New York State Energy Research and Development Authority in development of an IAQ guideline for Higher Education in NY: "Covid-19 Response Guide, State University of New York".



Dan Mizesko
Managing Partner/President, US Chiller Services International, writes on issues relating to chilled water systems, including operation & maintenance



Nabil Shahin
International Technical Director, AHRI MENA, writes on regulation-related issues in the GCC region.



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MACRO-ECONOMIC ANALYSIS:

READING BETWEEN THE LINES with Krishnan Unni Madathil

THE IMPORTANCE OF CREATING VALUE

Those governments and businesses who kept away from asking the tough questions regarding their fundamental utility and value propositions and from making the necessary changes are in the throes of being faced with their moment of reckoning, says **Krishnan Unni Madathil**

HAD SPENT much of 2022 speculating and pontificating about the trajectory of major segments of the world's economy based on a few core observations, primarily zeroing in on the relationship between value and personal ownership – and the impact of that on the global economy.

In my previous articles, going back a while, I had highlighted the persistence of the “fragility” of economic growth experienced in much of the world in the period since the Great Financial Recession of 2008 and how the reality of the intervening period has been a serial decline in productivity rates. What has kept up the numbers in the interim has been largely slick financial engineering, with extended bouts of suppressed interest rates and rabid money printing – oh, quantitative easing – propping up valuations and keeping people away from the reality of their positions. The years since the outbreak of the coronavirus pandemic, in 2020, has seen the abrupt and forceful dismantling of this stubborn edifice of propped-up value cutting across sectors in the economy.

Those governments, businesses and even individuals who kept away from asking the tough questions regarding their fundamental utility and value propositions

and from making the necessary changes during this extended lease of financial rope are in the throes of being faced with their moment of reckoning in the wake of the triple crises: One, the coronavirus pandemic and its fallout; two, the runaway inflation in developed economies, forcing central banks to go on a warpath by raising interest rates for the first time in 30 years, not once, not twice but a total of eight times within two years; and three, the Russia-Ukraine War and its multi-faceted impact on global energy supplies, global commodity supplies and on climate change mitigation efforts.

What we are witnessing is increasingly turning out to be the summary reversal of so many of the trends that defined the preceding three to four decades. I had previously called it “The Great Unbundling”; *The Economist* has preferred to call it “The Great Reversal”. I was there before them!

Whichever way the wind blows, the core question remains, as much for the individual as for businesses and governments, “Where do I find value?” The experience of the past few years has made it abundantly clear, and the turbulence of the coming few months will only double down further on the point, that it is only the cultivation of enduring



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value that will enable an enterprise at any level to survive and continue. All that the aforementioned triple crises have done is to take the cover off those who had not been working on improving their productivity and had, consequently, been living off the froth of an abnormally conducive environment.

The changes are abrupt and discomfiting and span across a wide range of areas, simultaneously. Like the abrupt rise in interest rates is signalling the unwillingness of capital providers to continue to subsidise risky bets in business and commerce, and the abrupt withdrawal of NATO from key operational areas such as Iraq and Afghanistan is signalling the unwillingness of the traditional security providers in the region to continue to subsidise risky security bets in international relations. Overall, the world's appetite for risk or largesse has undergone a severe deflation. The response from economic entities will be as expected: There will be balance-sheet trimming, there will be asset sales, there will be contract renegotiations and there will be lay-offs.

Governments that are running budget deficits will find it more difficult to manoeuvre, as France is finding out to its chagrin, as the country faces



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MACRO-ECONOMIC ANALYSIS:

READING BETWEEN THE LINES with Krishnan Unni Madathil

crippling strikes from government workers protesting against proposals to increase the age of retirement by a single year. The strikes in the United Kingdom over pay rates in the National Health Service have a similar flavour. Things get far more basic and fundamental in several cash-strapped governments with unmeetable welfare commitments, such as much of northern Africa, the Levant and South Asia. Clearly, this year will be tough for a lot of people across a number of countries. Sustainable Development Goals? Yeah, right!

Suffice it to say that but for a few notable exceptions, most people across the world who are counting on the welfare state are in for a very rude awakening.

But, what about the rest of us? The current state of affairs poses a predicament for an entire generation of working people. Not only have occupational and commercial conditions become inclement, but rapid technological change is rendering a number of even “traditional” jobs and skills-sets of the 1990s and the noughties redundant. The rapid development and mass adoption of new, more efficient ways of getting work done – apparently, this entire article could have been dreamt up by Open AI’s Chat GPT within seconds, and be possibly of a higher quality – which in decades past led to large-scale displacement of blue-collar work, will now begin to impact white-collar work, as well. The hyper-efficient automatic check-out counters at Carrefour are merely the first examples of this. Watch out for when AI models begin to give you investments advice and valuations, engineering

designs and motoring solutions upon a few command words. Wait, they already do in many ways!

It would not be hyperbolic to suggest that fundamentally, an entire generation of working-age people find themselves unaware and under-skilled for the economy shaping up around them. And the number of new, young people joining the workforce is not decreasing. The “obsolescence rate” of previously acquired skills is also increasing rapidly, making it critical for present members of the working-age population to keep up-skilling themselves. College education, once a rite of passage, is now merely a passing but firm and useful stepping stone for a lifetime of continuous learning, up-skilling and adaptability. Charles Darwin’s words seem at this stage, “It is not the strongest, or the largest or the most intelligent that survive; it is those that are the most adaptable to change that do.”

And this takes us right back to notions of value. Where does value come from? What makes us valuable? What makes us useful in the economy of today and keeps us useful in the economy of tomorrow? Can institutional frameworks complement efforts of the working-age population to remain sufficiently skilled and valuable? In the UAE, the public sector has taken cognisance of this and is increasingly encouraging its workers to take a whole year off, on a fully funded basis, to use the time to acquire new skills or to experiment with starting a new venture. The idea may not be so much to witness the next flurry of unicorns; but it may be simply to “nudge” the workers to draw first blood

in a world of open risk and opportunity and come out of their sheltered existence. How many public sector enterprises and their state managements across the world can dare try this out?

There is a crying need, now more than ever before, of entire sets of working-age populations in various geographies to have their skills-sets upgraded for the emerging economic and technological world. The emergence of a national-level, or even multinational-level, “skills bank”, to collate skills-sets and to encourage its constant nourishment and growth, is becoming an inevitability. Cue the move by the UAE government to instate a national skills bank in the form of “NAFIS”.

It would be worthwhile for companies to follow suit and for HR departments to begin to view their company’s manpower in terms of “captive brain capacity”, to chart out ways to nourish and cultivate this capacity and to make this a source of competitive advantage in the market. It requires mature consideration at an all-firm level, cutting across all age-groups, to identify ways in which the knowledge-and-skills quotient of the company can be improved. Several consultancies do that internally, and several companies have internal training programmes, but increasingly, this must align with fundamental questions regarding the role of each individual across the firm. I cannot think of any other way that the call for change can be dealt with in any more a humane manner.

At the national level, and even at the level of individual businesses, issues of accessibility and convenience to information and knowledge are becoming ever more critical, lest the skilling systems of today leave possibly billions of humans un-catered to. It is becoming increasingly clear that the amount of information and educational resources existing within the gilded halls of our universities is dwarfed by what exists outside of it, much of which at present exists in a state of disorganisation and entropy. The search for enduring value in all this is a continuous, ceaseless process. It behoves us all to constantly strive and improve our preparedness. [ccme](#)



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FIDIC ANY LONGER?



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If they are heavily amended, are they FIDIC contracts any longer?

THE TREND

It is often the case that construction contracts in the UAE are largely based on the FIDIC Conditions of Contract for Works of Civil Engineering Construction (usually referred to as the Red book), either the 1987 or the 1999 edition.

It is also common for far too many amendments being made to Part I of the Red book – that is, its General Conditions – usually by adding rider clauses in Part II (the Conditions of Particular Application, also known as Particular Conditions).

This practice, so prevalent in the UAE, renders it quite difficult to navigate between the General Conditions that come as part of a FIDIC Contract and the Particular Conditions, which far too often not only supplement but entirely delete and replace the pre-drafted standard wording of the FIDIC General Conditions.

THE PROBLEM

From a practitioner's perspective, it hardly pays to be too familiar with the standard FIDIC clauses in the UAE, because it may lead to presumptions about what has been agreed upon.

Such presumptions may far too often be contradicted by what has actually been agreed upon in heavily amended Particular Conditions.

Most amendments are carried out by employers and are usually heavily skewed in placing additional onus onto contractors.

This tendency to carry out excessive

amendments, rider clauses and deletion of standard clauses within the FIDIC General Conditions is exacerbated by the use of previously amended contracts, applicable to one type of project, replicated with further amendments to suit the needs of another project.

It is far too common for such amendments to be carried out by the commercial teams of contracting parties who have either minimal legal training or very little, if any, localised legal training, so that they can adequately address the requirements of the jurisdiction where the heavily amended FIDIC contract is intended to apply.

Whilst all this may seem as rather unorthodox, and possibly defeating the purpose of using a standard contract in the first place, it is nevertheless compliant with the general freedom of contracts applicable to most jurisdictions, including the UAE.

However, if the purpose of using a FIDIC contract is to imbue an advance familiarity to the users of a standard contract, with well-established clauses, without the need to read, each time, their extract letter, then this benefit is almost certainly lost due to the practice of relentless contractual alterations.

The same applies to an intention that a mere reference to a clause would denote the universally understood contents of that clause by all parties familiar with FIDIC.

This again would be an unfulfilled intention, because in an ecosystem

where FIDIC contracts are heavily amended, a very careful reading of each clause, with a cross reference to both the Particular Conditions and the accompanying Appendix, would be necessary in order to determine what the parties actually agreed.

This cross reference is often disjointed, and when parties amend the original text of the General Conditions, they create contradictions that make it difficult to understand what their true intentions were at the time.

THE SPECIFIC CASE OF DISPUTE-RESOLUTION CLAUSES

Perhaps the most vulnerable area for such unintended contradictions is anything related to dispute resolution, which is a part of the FIDIC contract that may make very little sense at all, if it is heavily tampered with.

As a result, unskillfully amended FIDIC-based dispute-resolution clauses often border on being either incomprehensible or simply unenforceable as drafted.

The result of this would be that the parties end up being forced to resolve their dispute before the local Federal Courts – the default capture arena of any deficient dispute-resolution clause – which was almost certainly not their intended forum.

THE CONFUSION IN PRIORITISING DOCUMENTS

Further complications may arise when the parties rearrange the priority of documents. This is, in itself, exacerbated, if the said documents themselves already contain amendments and deviations from the original FIDIC text.

This unnecessary, perplexing and often convoluted rearrangement of clauses, documents, riders and Particular Conditions that undo random parts of the FIDIC General Conditions ultimately result in more time and effort being applied to efficiently resolve any disputes.

This, in turn, results in more costs being incurred, more issues up for debate as to what the parties actually intended and more disgruntled litigants, if one interpretation is adopted by a given court or tribunal over another.

A POSSIBLE SOLUTION

To conclude, there seems to be little purpose in adopting a FIDIC contract if the amendments to it are substantial.

It may be best for all parties concerned to simply draft one final document where everything that is agreed upon can flow out of a continuous text, leaving only technical appendices, bills of quantities, drawings and specifications outside the main body of the contract.

In doing so, parties could ensure that no cross references are required to pre-drafted standard texts that have, through heavy amendments, in any event, been de-standardised. They could also avoid redundant priority of documents clauses that normally aim to ineffectively address potential contradictions.

In short, by creating one continuous

custom-made text – rather than a patchwork of extracts from a once-upon-a-time standard contract – all margins for errors and inadequate drafting could be minimised.

Finally, as is common, in any article that is intended to provide some form of guidance to the public, it has become almost mandatory to include a reminder that industry-specific legal advice and consultation should at all times be sought before parties commit to a document, the details of which they do not always understand or the intent of which they may incorrectly presume. **ccme**

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REGULATION ROUND-UP

AHRI writes a bi-monthly column on regulation-related issues in the GCC region, exclusively for *Climate Control Middle East*

WHERE ARE THE TRAINED AND CERTIFIED HVACR TECHNICIANS?

It's a no-brainer, really – manufacturers and distributors that certify their technicians often report drastic reductions in their warranty and replacement part costs, argues Nabil Shahin of AHRI MENA

AIR conditioning systems are a vital aspect of comfortable living, especially in the GCC region, where the climate can be scorching hot. However, to ensure that these systems are operating at their optimal level, it is imperative to have trained and certified technicians to perform installation, maintenance and service.

Regrettably, unlike in some other countries, there are no regulations or requirements in this region mandating that technicians be trained or certified. The importance of having trained technicians for air conditioning cannot be overstated. How do you know that the technicians you are using are properly trained to handle today's technologically advanced HVAC equipment or, for that matter, refrigeration equipment? Without a properly trained technician, the installed equipment may never achieve its rated performance.

One of the most critical aspects of air conditioning maintenance and service, for instance, is the handling of refrigerants. Trained technicians are able to properly handle refrigerants, reduce leakage and capture them properly, which not only protects the environment but also helps to avoid costly repairs. Contaminated refrigerants also significantly reduce equipment performance. With the new global environmental regulations requiring the switch to low-global warming potential (GWP) refrigerants, most of which are classified by ASHRAE as mildly flammable, trained technicians will be even more vital to ensure their safe handling. In addition, such technicians are trained to work safely and to follow industry standards and regulations.

Another important aspect of air conditioning maintenance and service is the brazing of piping. Trained technicians are able to properly braze the piping and ensure that it is leak-free, which is essential for the proper functioning of the system. Insufficient or incorrect refrigerant charges will drastically affect the equipment's rated capacity and efficiency. Improper charging is a very common issue with unlicensed or poorly trained technicians, and it causes the equipment to consume more power, run longer and break down more readily.

Properly trained and certified technicians have the knowledge and skills to perform maintenance and service on air conditioning systems, which can reduce the cost of installation, repair and service or of replacement parts for all stakeholders, including manufacturers, dealers, contractors, owners and end-users. They can also reduce the time and problems associated with installation. These technicians understand the intricacies of the different types of systems and can troubleshoot problems and make repairs quickly and efficiently. Manufacturers and distributors that certify their technicians often report drastic reductions in their warranty and replacement part costs.

The North American Technician Excellence (NATE), created by AHRI more than 25 years ago, is one of the largest non-profit certification organisations for heating, ventilation, air conditioning and refrigeration (HVACR) technicians. Its training materials and exams afford technicians real-world working knowledge of HVACR systems and



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validate their professional competency in equipment service and installation. The training and certification, with a nominal material and exam fee, can cover the basics of HVACR and expand to advanced and specialised areas and levels. Technicians are required to maintain their certification with continuous education to ensure that they stay up-to-date.

In today's digital age, when products are becoming more advanced and complex, with sophisticated system controls and motors, the importance of HVACR technician training has become more critical than ever before. As customers become more educated, they ask more detailed questions and have higher service standards. To ensure that technicians are equipped with the latest knowledge and skills to meet these demands, many manufacturers and contractors in this region are starting to require ongoing training for their technicians. The good news is that advancements in technology have made it easier for technicians to access remote training, online resources and virtual reality to stay current with the latest developments in the HVACR industry. This makes it more convenient for them to stay on top of the latest products, techniques and best practices.

Another important factor to consider when discussing HVACR technician training is compensation. In the MENA region, the average salary for HVACR technicians is relatively low compared to other developed countries. Offering higher

pay to certified technicians or sponsoring paid training/certification can motivate them to pursue training and certification, which can help them advance in their careers. This increased incentive can lead to a better-trained workforce, overall, helping to attract and retain top talent in the industry.

Another key factor that is worth mentioning is the importance of having proper equipment and tools to support the work of HVACR technicians. Providing technicians with the right equipment makes them better equipped to perform their job, which in turn helps ensure that the systems they work on are installed and maintained correctly.

Proper equipment also helps to ensure that technicians are able to work safely, and that they are able to diagnose and troubleshoot problems effectively. Investing in the right equipment is essential for ensuring that technicians are able to deliver high-quality service and meet the needs of customers.

Simply put, having properly trained and certified technicians for air conditioning and refrigeration installation, maintenance and service is crucial for proper functioning, reduction of costs and environmental protection. The lack of regulations or requirements mandating technician training and certification in the GCC region is a

concern, and organisations like NATE can provide valuable training and certification opportunities for technicians. Do not just take the word of technicians or providers with respect to competence. Instead, ask for or have them trained, tested and certified. Investing in the training and certification of technicians is a wise decision that will yield benefits in the long run for all stakeholders. **ccme**

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Henrique Pereira, CEO, Taka Solutions, firmly believes Cooling as a Service is the way forward at a time when financial headwinds are forcing many building owners to look for options to cut down on capital costs. Excerpts from an interview he gave to **Surendar Balakrishnan** of *Climate Control Middle East*...



Henrique Pereira



“ The centralised model offers diversity because of scale, but it entails a lot of distribution losses.

HOW would you define the scope of Cooling as a Service (CaaS)? Do the design, supply, installation, commissioning, operation & maintenance – including electricity – and repair charges rest with you as the provider of the service?

The purpose of CaaS is to offset from the customer any expense related to the chiller. We have to maintain, operate and retrofit it to a condition to meet the cooling needs of the building with the highest level of energy efficiency we can achieve. This includes replacement, upgrades, optimisation, operation costs, maintenance, spare parts, consumables, repairs and utility costs, so that the cost of owning and operating is translated to zero for the customer, after the customer enters into the CaaS agreement. The customer pays the tariff for consumption of chilled water. A District Cooling contract is similar – you pay for the installed capacity and the consumption, and a key difference is that CaaS is localised. There are other differences, of course. In District Cooling, there are common charges that don't apply in the case of CaaS. For instance, you have a connection charge in District Cooling; we don't charge the customer to enter into a contract. A District Cooling contract has a billing charge, which we don't have. Again, while District

Cooling involves a disconnection and reconnection charge, we don't have a suspension charge, in case you wish to refurbish a building, say. You have a Delta T charge in a District Cooling set-up; we don't have that. Our business is about efficiency, and Delta T is part of the efficiency equation. It does not mean every customer will have perfect Delta T, but as a variable, we don't charge.

In the case of CaaS, when it comes to consumption of chilled water, you pay zero if you don't consume any at all in a month. That said, a minimum consumption has to be met. In certain months, you can take zero chilled water, but on an annual basis, there is an average consumption charge. The consumption varies significantly in the course of the year – during summer, customers tend to use more chilled water, and during winter, they use less of it. Likewise, the Delta T is good in some months and very poor in some months. The point I am trying to convey is that you need to consume a minimum volume of chilled water for our model to work. But our charge is significantly less when compared to District Cooling. That is because we design a customised solution for every individual customer, and that is where CaaS essentially differs from District Cooling. We are not bound by rigidity. We can design a solution for them

that makes sense for their business and offers flexibility. And as a service provider, it allows us to design a suitable cooling solution. We address oversizing of cooling, Delta T-related problems and automation-related problems. I have been seeing these issues being spoken about in articles on District Cooling in *Climate Control Middle East* magazine. Our intention is to address all of these through launching CaaS. And the building next door may have a completely different solution. We don't impose solutions and say that they must fit everyone.

What about fuel surcharge, which is an integral part of District Cooling here?

When we pay utility charge, we absorb the fuel surcharge as part of that. We pay only one number.

How else is CaaS different from District Cooling? Is there a heavier leaning towards air-cooled chillers?

We use air-cooled as well as water-cooled chillers. So that would be the entire gamut of chiller, cooling tower, pumps, chemical-dosing units and everything. Our responsibility ends when the piping network is connected to a building. The primary and secondary loops are our responsibility, because you want to have full control over pumping. But it's not one-size-fits-all. For now, as I said, the primary and the secondary loops are our responsibility; however, if a certain customer has a secondary loop, then we do only the primary loop. The tertiary loop is the customer's responsibility.

District Cooling has the benefit of diversity and volume. If supplying to individual customers, there is no scope of distributing the costs, is there? I am trying to understand the financial model.

This is a conceptual difference between a centralised and a decentralised utility consumption model. You can

do a centralised utility-scale plant or build a rooftop model. I am not saying one model is preferable over the other – there are disadvantages and advantages. The centralised model offers diversity because of scale, but it entails a lot of distribution losses. You would have to carry chilled water across several kilometres, and you would have lot of temperature loss. If a rupture happens in a main chilled water pipe, you would be denying chilled water to every customer. From our point of view, the group we are part of as a company, we believe firmly in the decentralised approach, which we feel is the more effective way of generating locally and consuming locally. And we see a far bigger advantage in the custom-designed and custom-built approach, as per the need of each customer. In a centralised approach, you are building a massive capacity, which means you are compelled to supply that much. You have massive infrastructure in place.

We believe the decentralised

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model makes sense, because different customers have different needs. We are able to offload a lot of diversity factors through our capacity to design customised solutions; if you do one-size-fits-all, it won't work. In a centralised model, you have to maximise efficiency at every demand point you have. This requires lot of engineers and lot of controls. And that is why a lot of centralised projects don't work as efficiently, because it is a simplistic approach to a complex problem.

If you have a cooling load of 3,000 refrigeration tons (TR), you don't know what equipment they are using this cooling for. In my case, I would be going to a customer that has a particular business profile. I would study their need and, subsequently, tell them that the best solution is "XYZ". In the case of the next building, I might design differently.

No centralised model can custom design a solution. We believe a decentralised approach is the best bet for efficient cooling, because in the case of a localised model, we can deploy different solutions throughout the lifetime of the contract. Indeed, in 3-5 years from now, a new technology might arrive that saves more water and energy, in which case I would be interested in deploying it. The client as well as I, as the service provider, will get direct benefit from that. In the first two-thirds of the contract, I would continue to deploy new technologies to get better results. This is possible in a decentralised model. In a centralised model, I would need to apply the minimum common denominator for every customer. We are inclined to think that a decentralised approach suits the market best. We are seeing a world that is moving to a decentralised model of doing business that is tailored to your particular needs.

How do you measure consumption of thermal energy, assuming that the building is residential and that each flat is occupied by different individuals?

You have two different realities that you would need to separate. The first is a chiller-free building, and there are many buildings that are chiller-free. In such a case, metering and billing involves the total volume of chilled water supply, and you issue one bill to the manager

of the building. You also have the situation where every tenant pays their own chilled water bills, in which case we have partners working with us – billing agents – and you have metering infrastructure that we install in every flat. We are also offering for the possibility of owners that have a chiller-free set up who might want to convert to a regime where the tenants would pay the bills. If you pay per square feet, this is the opposite of efficiency, because you pay the same whether you use more or less chilled water.

If you pay your own energy bill, you will have more concern. If you go on a 15-day holiday and leave the AC on, you would pay more. So, we are promoting a culture of responsibility through a decentralised approach. We are saying that each customer has the freedom to use how much they want. If the AC in the apartment is running 24x7, you are free to do that – and you are going to have to pay a lot more. So, this makes you responsible for your own action.

In a decentralised approach, are there any penalty charges by the customer to the service provider for possible downtime of the plant?

We have SLAs (service-level agreements) in our contracts, and we have a responsibility, contractually, to deliver cooling within certain technical characteristics. And if we fail to deliver, there are penalties. To make sure we don't enter those situations, we enter into agreements with third-party service providers. If peak summer and you are using full capacity and the chiller goes down, we have redundancy planned for the situation. And if something catastrophic happens, we have rental equipment, etc., to ensure no one goes without cooling. Now, this might have a slight impact on cost, but we have to make sure. We maintain chillers at a very high level and we have spare parts. And we have 99% of the time when everything is going well.

We have predictive maintenance in-built as a feature. We have a full controls system that offers real-time and 24x7 vision and 30 points on every chiller. We have very good level of information on the performance of every chiller. If the chiller is delivering the performance we want, the name of our game is not

efficacy but efficiency. It must work at a specific efficiency level. And this is where the customer benefits, as well. Many customers compromise on maintenance contracts and fail to take good care of the chiller owing to budget constraints, but we are particular about maintaining to the highest standards, because that's the way to achieve maximum efficiency.

Typically, what is the installed capacity and number of chillers in a CaaS project?

It depends upon the customer. We have done two chillers, and we can do 18 chillers. We don't have any boundaries. Most of the models don't work well below 400-500 tonnes – the net benefit for customers is very low if less than 400. That said, we have done 250 tonnes, because we felt the need for it; in that case, we achieved a very tiny saving as the net benefit. In most cases, we refrain from doing that small a tonnage, for 90% of customers will not be attracted by tiny savings. Broadly speaking, we have no dogmas when it comes to looking at every project and seeing feasibilities.

What is unit rate/tonne charged to the customer?

It completely varies. If custom-made, we can propose different tariffs to different customers. We want to achieve the lowest price point, so we can pass on the benefits to end users. We want to give net-positive solution as benefit to them. If not net-positive, we won't do it, because else it does not make sense. And these may vary a lot depending on profiles of customers, because some customers have very high consumption or very high capacity. We really don't have a standard charge. We look at current consumption pattern of customer and we calculate how much they are paying to run and operate, and we would look to offer a lower tariff. And we drive efficiency high, because we want to drive price down, down, down.

Is the chiller plant offered with BMS and CMS – Chiller Management System?

For us, the most important requirement for O&M is data. If we don't have data to tell us what exactly has happened

in all the main components we cannot maintain. So, we have a controls system that measures many different parameters of chiller, pumps and cooling tower to not only understand if they are working or not but also their performance level. We can understand you may have a compressor working, but it may not be working at the performance level. So, we go deeper – much deeper, in fact – than your typical company that takes care of your chiller. For many, if the chiller runs, it is enough; for us, it needs to run at a particular efficiency point. If not, we would intervene and understand the cause for the efficiency points we designed not being achieved. It may be there is some control strategy that we need to adjust, or simple cleaning that we need to carry out. There are many possibilities, but for us running is not enough – it has to run at a specific efficiency point, and if not, we have to improve it, because our model depends on efficiency.

Who will pay for the electricity charges consumed by the other systems, including AHUs, FCUs and other accessories?

Our areas of focus are the chiller plant and everything that is attached in the chiller yard. As CaaS, my responsibilities stop there. We don't enter the air side at all. We would offer airside optimisation as an ESCO, but in CaaS, we offer it as an option. We assess the efficiency of the entire solution. But our solution as CaaS is restricted to the chiller plants. We offer the client a range of possible solutions that can be contracted under different models as an energy performance contract.

Will the plant have additional capacity in case of expansion in the building?

Yes, but we will not install until it is needed, because then it would not be efficient. For us, efficiency is a very big obsession. If you expand, we will expand our chiller yard, as well. I will

buy and install at my own cost, as and when I need it, because otherwise, I will charge you for capacity that you are not using now. We are efficient in the way we bill – we don't want to over bill.

How much would be the price that would have to be paid by the owner after 15 or 20 years of operation? Would the asset – chiller plant – and maintenance be transferred to the owner after 15 or 20 years? What are the ramifications if and when the chiller plant's efficiency drops and the maintenance cost becomes high? I am asking from an owner's perspective.

If your question is, "How much will the customer pay at the end of the contract?" the answer is zero. We will transfer all assets free of charge. There is an option – you may renew your contract for another 15 years, and as long as we have an active contract, we will continue to charge the infrastructure. **ccme**

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USING THIRD-PARTY TESTING TO VALIDATE BUILDING TRACING

Independent testing can be a catalyst for a healthy dialogue and a process for continuous improvement, argues **Jeremy McDonald**

SINCE the early days of the pandemic, there has been increasing awareness that Indoor Air Quality (IAQ) is a key factor in the mitigation of the spread of COVID-19 viral particles. Business managers from a wide spectrum of businesses – nursing homes, K-12 and office complexes, to name a few – have been inundated with various solutions, all with the promise of protecting building visitors and staff.

With all this information, facility managers are, at times, overwhelmed wondering which product is the best for their particular needs.

This article will explore and define a pragmatic approach to testing and verifying the performance of IAQ investments. While the real-world experiences at an upstate NY School District – New Rochelle School District – focuses on testing and verification of bi-polar ionisation (BPI), the independent testing approach I describe in this article can be applied to a host of technologies.

BACKGROUND

One morning in early April 2020, in the early days of this long pandemic, I was sitting with two colleagues – we will call them Marty and Bill, because those are,

indeed, their names – trying to wrap our heads around how the deadly viral particle, SARS-CoV-2 spreads. Through our deliberations, which were based on close to 100 years of HVAC experience, we kept coming back to the same conclusion – that this very tiny, invisible viral particle, which is more than 100 times less than the diameter of fine beach sand, would be at its most dangerous in spaces with high occupant density, lack of ventilation and sub-par relative humidity.

Over the next few months, we explored a host of IAQ strategies. Although we had experience with several of these technologies, they were historically viewed as “nice to have” air-cleaning technologies, rather than a primary defence of protecting building occupants. As we brought ourselves up to speed on the nuances of the most marketed technologies, such as photocatalytic oxidation (PCO), BPI and ultraviolet (UV-C), we came to the conclusion that testing and verification of results offered the key to determine what works, and what is ineffective.

After some brainstorming, we came to the conclusion that to analyse the real-world application of these “old but new” air-cleaning technologies, we need to apply the same independent



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commissioning process, which is commonly applied to any major mechanical/electrical project. Be it a new air-handling system, BMS, chiller plant or what have you, the independent commissioning process is always the same: The Cx Agent will review the design criteria and specifications, develop a test and then independently test the system to determine if the new mechanical/electrical system performs to the desired outcome.

The balance of this paper will lay out a real-world example of the New Rochelle School District, a community just north of New York City, which experienced firsthand the trauma of the early days of the pandemic and how data-driven commissioning can show real-world performance of air-cleaning strategies.

PROOF OF CONCEPT

The community of New Rochelle was front and centre in the early days of the pandemic, when one of its community members, dubbed Patient Zero by the press, fell ill with COVID-19. The story of Patient Zero was the precursor to the viral spread, shutdowns, and the social and economic dislocation that we all experienced, here in the United States and throughout the world.

As “normalcy” began to return in the spring of 2021, the New Rochelle School District decided to embark on a case study to explore the IAQ benefits of BPI. Working with Pandemic Solutions, which is based in New Rochelle, and Atmos Air, a vendor for BPI, they came to the conclusion that before they invested in BPI for the whole district, testing the systems in a few places was more prudent.

New Rochelle reached out to Guth DeConzo Consulting Engineers to perform the testing and validation. After discussions and deliberations, my team and I set the following parameters for the test:

1. Since the intent of any air-cleaning technology is to protect the occupants, testing needs to be done in the space. There is no use, other than troubleshooting, to test for IAQ in the supply ductwork, since that is not where the students and teachers are located.
2. The intent of the BPI product is to increase ions in the space. While the science behind how ions clean air and neutralise particles is beyond the scope of our mechanical engineering expertise and this article, the test needs to determine that ions are brought to an appropriate level (roughly 1,500 ions-per cm³, as established by the equipment vendor) in order to be deemed successful. It should be noted that as the independent testing team, we are not in a position to deem a space safe or unsafe if the ion target is met.
3. Ozone, which is a known irritant and health hazard to human lungs, has historically been a byproduct of “some” air ionisation devices and has been a historical concern. Standards exist, namely UL 2998 here in the United States, to certify low ozone emissions. To qualify for UL 2998, which the products tested in this study comply with, a product must prove it releases less than five parts per billion. Although perhaps “belts and suspenders”, since the product is already UL 2998 compliant, we tested for ozone in the space, since the school business officials anticipate that there will be questions from the various stakeholders, including teachers and parents.
4. Volatile Organic Compounds (VOCs):

High levels of VOCs are also a health concern and a major factor in Sick Building Syndrome complaints.

Therefore, the test included testing of VOCs to ensure that the ionisation process did not increase VOCs, but in fact could reduce VOCs and provide fresher, less odorous air. See discussion on next phase of the project on why moving forward, we determined that formaldehyde, in addition to VOCs, in general, should be included in testing.

5. Particle count: One of the basic premises of BPI is that it will neutralise particles and, over time, amalgamate particles, making them fewer and larger, so that air filtration and gravity can “clean them from the air”. For this reason, particles are counted, since one would expect a reduction in particle count as a result of the air ionisation.

Logged every minute for each 15-minute trial (Eco Sensors-Model C-30ZX).

- Particle count: Trending was done for 0.3 µm, 0.5 µm, 1.0 µm, 2.0 µm, 5.0 µm and 10.0 µm (per cubic foot). Total counts per cubic foot were recorded once per 15-minute trial (Fluke-985 Particle Counter).

- VOCs- Volatile Organic Compounds (parts per million, ppm): Logged every minute for each 15-minute trial (Eco Sensors-Model C-21).

- > Ensure ioniser is ON: Conduct Operating Trial of 15 minutes.
- > Ensure ioniser is OFF for a minimum of fifteen minutes (prescribed time for ions to clear the space and natural conditions to return): Conduct Baseline Trial of 15 minutes
- Note: Operating Trials were conducted before Baseline Trials. It

Figure 1: Test Basic Information-Pilot Study

Spaces Tested			
Room Name/Number	Classroom Rm. 122	Classroom Rm. 124	Multi-Purpose Room
Room Dimensions	27’x33’	27’x33’	53’x62’
Area (ft ²)	891	891	3,286
Ceiling Height (ft)	9’	9’	11’
Air Ionisation Device	(2) FC-400	(2) Rainier Units	(2) Matterhorn 1002

THE PILOT TEST

The pilot test was done for a diverse set of K-12 spaces. Recognising that the intent was to determine if the ionisation could be successful under different operating conditions, two class rooms and a multipurpose room were chosen. One classroom was conditioned with a traditional unit vent, while the other classroom didn’t have mechanical ventilation. The multipurpose room was served by an air-handling unit.

The basic information for the three locations are shown above (see Figure 1).

Once the criteria were established, Guth DeConzo developed a testing procedure as follows:

- Setup testing equipment in centre of room at desk level. Refer to Figure 1.
- > Data trending of the following metrics for each 15-minute trial (Baseline & Operating):
 - Ion count: Ions per cubic centimetre were logged every minute for each 15-minute trial (Alpha Lab-Model AIC2).
 - Ozone (parts per million, ppm):

takes approximately 1-2 hours for the ions to fully saturate the room air; therefore, it was beneficial to have the ionisers already operating for a considerable amount of time prior to conducting tests.

- > Record all data and ensure that ion concentration and ozone generation meet the following criteria for a PASS/ FAIL designation:
 - Ion Concentration: Ion concentration should increase by at least 500 ions/cm³ and maintain ion concentration range of 1,000 ions/cm³ - 1,500 ions/cm³.
 - Ozone Concentration: Ozone production is certified by UL 2998. However, due to historic concerns about ozone, my team and I measured ozone to provide data to decision-makers. For all spaces, ozone increase was negligible.
 - All other IAQ metrics, in addition to ion and ozone concentrations, shall be presented in this report for further validation of proper operation.

Figure 2: Testing Equipment

Device Type	Manufacturer/Model	Units	Range	Accuracy/ Limits
Ion Sensor	AlphaLab Inc. / AIC2	Ions/cm ³	Std Range: 2 million ions/cm ³ Dual Range: 200 million ions/cm ³	+/- 20% accuracy
Particle Counter	Fluke / Airborne Particle Counter 985	Particles/ft ³	0.3µm, 0.5µm, 1.0µm, 2.0µm, 5.0µm, 10.0µm	10% @ 4 million particles/ft ³ concentration limit
Ozone Monitor	Eco Sensors Inc. / C-30ZX	ppm	0.00 ppm – 0.30 ppm	+/- 10% - 20% accuracy
VOC Monitor	Eco Sensors Inc. / C-21	ppm	0 ppm – 140 ppm	Calibrated for perchloroethylene (50 ppm TLV)
Formaldehyde Sensor	Aeroqual / Series 500	ppm	0 ppm – 10 ppm	+/- 10%
CO ₂ Monitor	Telaire / 7001 CO ₂ /Temp	ppm / °F	0 ppm – 10,000 ppm / 32°F - 122°F	+/- 5% (CO ₂) +/- 2°F (Temp)

THE PILOT TEST RESULTS

The test results for the three spaces are shown below...

Figure 3: Test Results - Pilot Study

TEST RESULTS - PASS IF IONS INCREASE BY MORE THAN 500 IONS/CM ³ AND MAINTAIN RANGE OF 1,000 IONS/CM ³ - 1,500 IONS/CM ³									
Trial	Average Ion Reading (per cm ³)	VOC (ppm)	Particle Size and Count (per ft ³)						Ozone (ppb)
			0.3um	0.5um	1.0um	2.0um	5.0um	10.0um	
Rm 122 - Baseline	262	6	990,222	91,092	12,060	5,468	972	363	0.44
Rm 122 - Ioniser Running	1,411	2	649,289	57,777	6,119	2,197	296	119	3.22
Percent Change	439%	-69%	-34%	-37%	-49%	-60%	-70%	-67%	626%
Ion Increase - PASS/FAIL	1,149 - PASS								

TEST RESULTS - PASS IF IONS INCREASE BY MORE THAN 500 IONS/CM ³ AND MAINTAIN RANGE OF 1,000 IONS/CM ³ - 1,500 IONS/CM ³									
Trial	Average Ion Reading (per cm ³)	VOC (ppm)	Particle Size and Count (per ft ³)						Ozone (ppb)
			0.3um	0.5um	1.0um	2.0um	5.0um	10.0um	
Rm 124 - Baseline	194	2.28	865,503	81,102	8,910	3,110	315	44	1.82
Rm 124 - Ioniser Running	1,098	2.02	760,695	67,915	7,501	2,846	408	121	1.45
Percent Change	467%	-11%	-12%	-16%	-16%	-9%	30%	177%	-20%
Ion Increase - PASS/FAIL	904 - PASS								

TEST RESULTS - PASS IF IONS INCREASE BY MORE THAN 500 IONS/CM ³ AND MAINTAIN RANGE OF 1,000 IONS/CM ³ - 1,500 IONS/CM ³									
Trial	Average Ion Reading (per cm ³)	VOC (ppm)	Particle Size and Count (per ft ³)						Ozone (ppb)
			0.3um	0.5um	1.0um	2.0um	5.0um	10.0um	
MultiPurpose Rm - Baseline	847	6.8	819,342	66,713	6,817	2,395	600	422	3.00
MultiPurpose Rm - Ioniser Running	1,608	2.9	601,540	37,846	3,840	1,621	300	293	4.47
Percent Change	90%	-57%	-27%	-43%	-44%	-32%	-50%	-31%	49%
Ion Increase - PASS/FAIL	761 - PASS								

The above chart (Figure 3) is a graphical interpretation of the particulate data. Presenting this data this way is important to educate the client and stakeholders on what is happening (that is, particle counts are being reduced) through the invisible process of air ionisation.

Figure 4: Site testing equipment and space

Particle Counter &
Ion Meter

Space Temperature
& %RH Logger

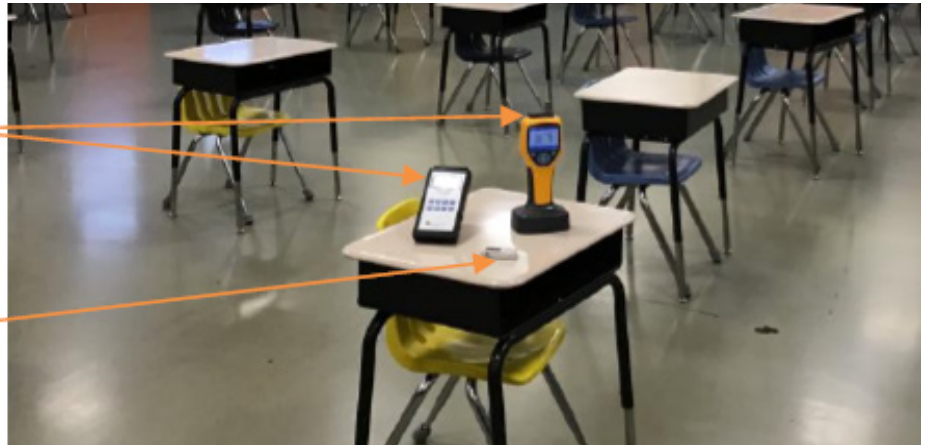
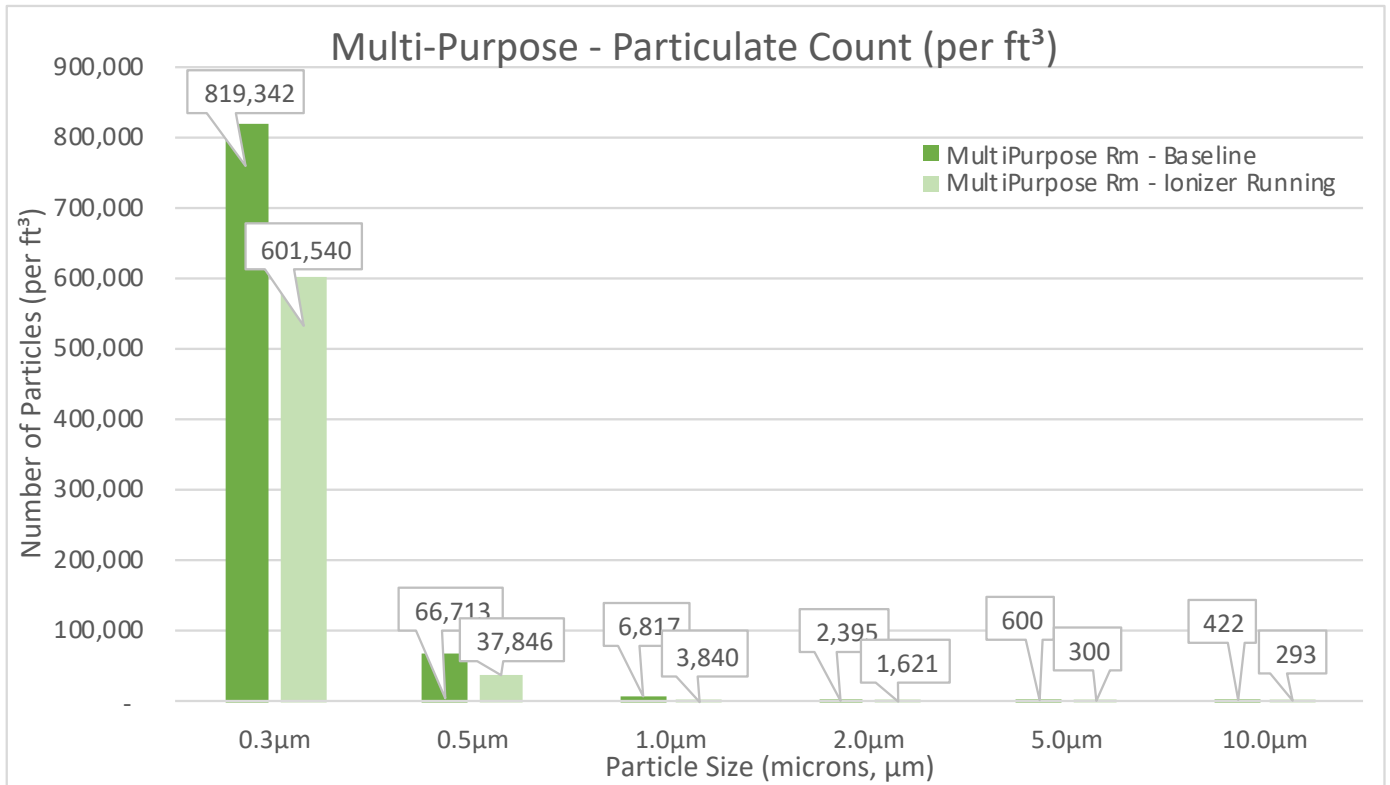


Figure 5: Particle Count Reduction (for multiple size particles)



A review of the data revealed the following:

- Particle count for all sizes was documented for all size ranges. In general, particles count did decrease, as expected. Note that although particle reduction target was not a criteria of the test, we did want to document particle reduction, since lack of reduction would call into question the whole premise and theory of air ionisation.
- Ion concentration exceeded the target increase of 500 ions/cm³,

and attained the target of range of approximately 1,500 ions/cm³ (the reading is actually slightly higher at 1,608 ions/cm³).

- Ozone did increase for two of the spaces, but only slightly, which we deem as inconclusive. Note: That background ambient ozone readings were approximately 200 ppb, which coupled with UL 2998 certification should address any concerns that various stakeholders have regarding the ozone concern.
- VOCs decreased by approximately 50%.

After conferring with the client and reviewing the results, it was agreed that the testing was satisfactory; and the client elected to install the air ionisation technology throughout the District.

Once the air ionisation installation was completed for the District, Guth DeConzo was retained to perform testing for approximately 10% of all installations, which was approximately 100 spaces in total.

Also, recognising the concern of the public regarding “unintended consequences” of IAQ air cleaning, we

Figure 6: Summary of Results - District-wide Test (District-wide average)

COMPILED DATA - AVERAGE ACROSS 97 SPACES - NEW ROCHELLE SCHOOL DISTRICT										
Trial	Average Negative Ion Concentration (per cm ³)	VOC Concentration (ppm)	Formaldehyde Concentration (ppm)	Particle Size and Count (per ft ³)						Ozone Concentration (ppb)
				0.3µm	0.5µm	1.0µm	2.0µm	5.0µm	10.0µm	
Baseline Trials	1,390	1.94	0.27	1,575,058	181,253	35,164	11,975	1,281	160	2.04
Operating Trials	2,678	1.82	0.25	920,375	100,207	20,418	8,498	1,252	176	2.01
Percent Change	93%	-6%	-10%	-42%	-45%	-42%	-29%	-2%	10%	-1%

added formaldehyde concentration, which is part of the Aldehyde family and which is of special concern to public health officials, to the complement of contaminants my team and I were testing for.

At the completion of the study, a formal report was completed and provided to the owner. The study included the methodology, test results (by space for each of the approximately 100 spaces selected), cut sheets of equipment and supporting research articles on air ionisation.

The summary results of the complete testing are shown in the table, above (see Figure 6).

CONTINUOUS COMMISSIONING – BUILDING TRACING

The New Rochelle management emphasised investment in IAQ is not a one-shot deal but more of a new way of thinking of how we manage our buildings. With this in mind, New Rochelle tasked Guth DeConzo with the following additional tasks:

1. Training of facility staff: The training included hands-on training of the BPI devices, along with the theory and practicality of IAQ best practices.
2. Seasonal testing: Similar to traditional Cx, Guth DeConzo performed a seasonal test, six months after installation, to ensure the units are still in operation.
3. Long-term Building Tracing: As part of the contract, New Rochelle invested in data-logging devices to monitor the IAQ of the spaces. As part of our Cx efforts, we commissioned these devices to ensure that they are operating correctly. The data-logging devices are used to monitor the space IAQ on a continuous basis and will inform the user when there is an issue.

THOUGHTS ON FURTHER TESTING

Currently, there is no independent testing procedure for “in use” air-cleaning devices.

If building IAQ tracing is to be successful, we need to have established rules, so we all know what success looks like.

Below is a proposal for IAQ testing protocol...

1. Establish performance criteria. For this test, my team and I established “Pass/Fail” criteria of increasing ions by 500 ions/cm³ and target of reaching 1,500 ions/cm³. There is nothing sacred about this “Pass/Fail” criteria, but it is based on vendor data of what is reasonable and stated as effective.
2. Keep it simple: Only test for the variables that are key to success and keep analysis as simple as possible. While each air-cleaning technology is different, we only recommend testing for variables that are truly indicative of overall success for the particular technology, since adding testing of other secondary variables (that is, airflow, background variables, etc.) will add time and expense, which may make the testing cost prohibitive.
3. Ensure proper sample size. We chose 10% of spaces for the test prescribed in this document. For smaller installations, we recommend a larger sample selection.
4. Transparency: Air is invisible, therefore transparent data is needed to demonstrate results. Providing data to owner will allow for more transparency and give confidence in the testing procedure and test results.
5. Test for conditions at hand. In developing the criteria for testing, my team and I did consider expanding the testing for a whole slew of other variables (that is, control variables for outdoor weather conditions, room geometry, airflow, temperature/relative humidity, etc.) with the hope of normalising the final data set. However, recognising that for independent testing to be successful it needs to be

repeatable and affordable, we elected to establish simple criteria, which can be used for any type of space and any background conditions. While a more data-driven approach does have its advantages, we concluded that applying the “80/20” rule (80% of benefit for 20% of the cost) has a better chance of wide-scale implementation and support of our ultimate goal – ensuring that IAQ strategies realise the results we expect.

CONCLUSION – WHY INDEPENDENT TESTING

The pandemic served to surface the need for ensuring air quality in our facilities and buildings, and our hope is that third-party testing will lead us down a path for validating solutions that monitor for unknowns and invisible toxins that we were only made aware of as a result of the pandemic. The pandemic necessitated improvements in IAQ, but good IAQ also serves to maintain a healthy environment for non-public health emergency times, which we hope is the norm in the future.

More so, independent testing can be a catalyst for a healthy dialogue and a process for continuous improvement. As an example, only through healthy dialogue and challenge of results by the client, we concurred that we should add formaldehyde testing for future test results.

Only through independent testing, objective evaluation of the results and transparent reporting of results can we determine if the client’s investment in air cleaning devices are producing results. For decision-makers, who are concerned with results for their stakeholders, independent testing is a sure way to ensure the investment in air cleaning is worth it. [ccme](#)

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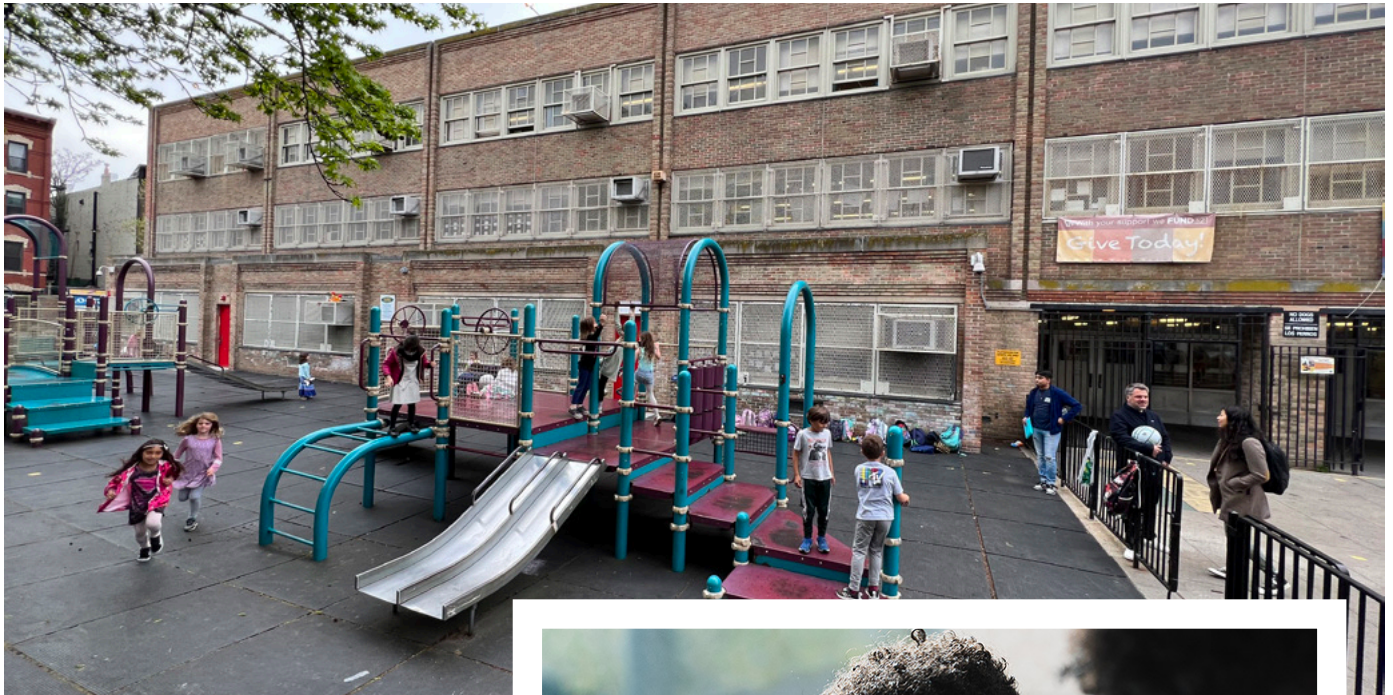
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A portrait of Dr. Flavia Dinnebier, a woman with long, wavy brown hair, smiling. She is wearing a dark blue blazer and a gold necklace. The background is a plain, light-colored wall.

'A LITTLE BIT SAFER'

Dr Flavia Dinnebier, Research Director, Enerf Institute, says MERV-13 filters, deployed across schools that come under the New York City Public School District, are protecting students against deadly viruses

Dr Flavia Dinnebier



ACCORDING to the United Nations, one new infectious disease emerges every four months across the globe. In that context, building filtration may play a crucial role in mitigating future respiratory infections caused by viruses. Respiratory infections – including the common cold and flu, as well as asthma – are caused by airborne pathogens.

Eneref Institute examined how New York City public schools' early adoption of MERV-13 filtration in window air conditioning units may have reduced COVID infections. Eneref Institute is a Washington DC-based research and advocacy organisation for socially responsible sustainable development. The NYC public school district is the largest in the United States, with over one million students. To protect students from respiratory virus infection, MERV-13 air filtration is highly recommended by organisations responsible for school safety. Equally important, MERV-13 filters improve IAQ, minimising adverse health effects for students by reducing pollutants.

The New York City school buildings' filtration upgrade has not been well-publicised and is the Education Department's best-kept secret in their fight against COVID-19. "I know about the filters, because I'm friends with the custodian, but I don't know if everyone else knows," said Leisha Borden, Secretary to the Principal of Boys and Girls High School. "It would make them



feel like I feel—a little bit safer."

The air conditioning units in the schools act as a filtration system to capture virus particles throughout the year by continually re-filtering and circulating conditioned air regardless of temperature demand.

Lavonne Gaston, Parent Coordinator at Boys and Girls High School, noted, "We talk about the cleaning and all those things with parents, but I think sometimes we don't go into the air conditioning and those types of details with them."

Eneref found that during cooler,

winter months, the units were used in fan-only mode, where the energy demand is negligible. Howard Blady, Owner, Klearview Appliance, said: "You can put it on fan mode to [capture the virus], and it'll cost you a fraction of the money in energy. You're only spinning the fan motor, and you have MERV-13 filtration." The New York City Department of Education (NYCDOE) purchased the MERV-13 filters from Klearview Appliance.

All of the window air conditioning units installed with MERV-13 filters were manufactured by Friedrich Air

Conditioning Co., a 140-year-old American company. Early in the COVID-19 pandemic, Friedrich recognised that their standard window and through-the-wall air conditioner lines were already built with the necessary headroom to expand their filtration from a MERV-6 to a virus-removing MERV-13.

The United States EPA Science Advisory Board consistently ranks indoor air pollution among the top five environmental risks to public health, as indoor contaminants can be as much as 100 times higher than outdoor levels. Beyond increasing exposure to respiratory viruses, poor indoor air in schools has been shown to aggravate asthma, allergies and other respiratory illnesses in students.

The HVAC equipment in schools almost certainly played a role in the transmission of the COVID virus; according to ASHRAE's "*Filtration & Disinfection Guidance*" document, issued on May 7, 2021, "airborne transmission of SARS-CoV-2 is significant and should be controlled". Outdoors, viral particles are dispersed by winds. Indoors, proper filtration is needed to reduce concentration and, thus, the overall viral dose to which occupants are exposed.

The MERV-13 filtration in the NYC school buildings help protect the students from contracting the SARS-CoV-2 virus. While the individual virion molecules are only 0.1 micrometer in size, the virions are embedded within, and spread through, respiratory droplets that are an order of magnitude larger – 1-3 micrometers in size. MERV-13 filtration is 85% effective at capturing particles in the range of 1-3 micrometers – more than five times the efficacy of the more common MERV-8 filters.

In August 2021, John T Shea, CEO, Division of NYC School Facilities (DSF), directed custodian engineers to install MERV-13 as replacements for existing air conditioner filters. Custodial staff, who regularly maintain the school district's entire HVAC system, replaced the filters at 30-day intervals. To assure against any leakage, the filters were installed using filter clips provided by Shea's department. Four months later, in December 2021, the New York State Education Department sent out its own directive from the Office of Facilities Planning, recommending "high efficiency MERV-13 air filters as a



proven and safe method for removing pathogens and other contaminants with the HVAC system". Funds for the filters were authorised by American Rescue Plan (ARP) education funds.

Based on research for this report, Eneref Institute found that almost all window air conditioners sold in the United States are now manufactured in Asia. In order to fit a greater number of air conditioners onto shipping containers, Asian-manufactured units are built necessarily small, leaving little room for a more robust filter.

Blady explained: "You've got to get the packing boxes to a certain size, because you don't want to fit two-and-a-half boxes across your shipping container. You want to fit that third box. That's not a concern for Friedrich. They just pack them on trailer-trucks. That's why their product makes sense."

A further obstacle for Asia-based manufacturers is that the cost of shipping has increased significantly during the pandemic. Although the Friedrich filters are proprietary and need to be replaced regularly, today they are still the only major window air conditioning units that house a MERV-13 filter.

Outside air dilutes indoor airborne contaminants, which is why opening windows is recommended. However,

the United States Center for Disease Control suggests that while ventilation can reduce the risk of viral exposure, it will not eliminate risk. The air conditioners installed in New York City Schools are designed to allow some outside air to ventilate the classroom. At the same time, their MERV-13 filters limit the need for an overabundance of outdoor air, thereby lowering the costs of heating and cooling from temperature differentials.

Grecian Harrison, Principal, Brooklyn's Boys and Girls Highschool, explained that schools should be a place where students achieve success and embrace learning in a safe and supported environment. Healthy indoor air is part of that school's safety programme and should become standard, not just at Boys and Girls, but in commercial, industrial and institutional buildings across the United States. **came**

The author of this article has a PhD in Environmental Education and is Master of Environmental Law. She may be reached at flavia.dinnebier@eneref.org.

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ONWARD AND UPWARD

Welcome to our new Safario Cooling Factory – a much bigger and better facility, at Dubai Industrial Park



The Late N V Anto, Founder, Safario Group of Companies



Drone-view of the new factory

THE rapid rate of technological advancement has opened doors for opportunities as well as challenges. The skill to innovate and the ability to adopt, and to adapt to, the latest technologies are the challenges we face in the industry.

We at Safario Cooling Factory accept these challenges in meeting the requirements of our clients for innovative products. Our team of engineers work alongside our R&D team and develop the best possible products that would fulfill our clients' requirements.

In that context, our new HVAC manufacturing facility, located in Dubai Industrial City, is a symbol of our intent, our spirit of innovation and our ambition. It is not just any facility but is the only HVAC manufacturing base in the UAE that is 100% solar-powered, reflecting our green ethos and underlining our commitment to sustainable development.

Over the years, we at Safario have specialised in, and developed, a wide range of heat exchangers, with applications in all areas, including Oil & Gas and

marine operations. This is in addition to our existing range of customised chillers, panel air conditioners and air-handling units (AHUs) that are a staple product at Safario.

We also supply heat exchanger coils for OEMs – these find their way into window air conditioners and industrial chillers of leading international brands.

In addition, we specialise in manufacturing PU insulated panels for AHU applications for leading international brands.

And in a special initiative related to the agricultural economy, we have developed an exclusive product range suitable for greenhouses. This has brought down the cost of maintaining greenhouses and improved the shelf-life and quality of farm products whilst reducing the cost of the end product, resulting in substantial savings to greenhouse owners. Currently, we are developing products for the Saudi Arabian market, in collaboration with our associates involved in the development of greenhouse-related technologies.

Another area of our work pertains to coatings. Indeed, we are involved in anti-corrosive coating of brands like

Lateral development

We at Safario Group are immensely proud of our diversification – comprising three divisions, besides Safario Cooling Factory...

The three divisions are...

A. Safario Trading LLC, which distributes the Sapphire brand of air conditioners. The division is also one of the top stockists or retailers of international air conditioner brands in the UAE.

B. Safario AC Maintenance LLC. This division undertakes installation of chillers and other HVAC products as well as their maintenance.

C. Safario Industries LLC. This division specialises in creating innovative, technologically advanced and custom-designed architectural façade systems and other sheet-metal fabrications.

Heresite, Corrotech and Infiguard and are authorised applicators of the same.

Whilst innovation and product development is good, we believe it is equally important to deliver quality and good service. At Safario, we, as a team, are devoted to quality and reliable service. Over the 35+ years in the market, and in our long affiliation with numerous clients across the GCC region, we have earned a fair share of goodwill in terms of quality and trust. This goodwill, over and above every other attribute we have earned, ensures our relevance and status as the 'Gold Standard of the HVAC industry'. **ccme**



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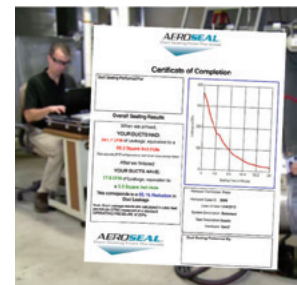
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Contact: vilas.bakshi@aeroseal.com

UAE President announces 2023 as 'Year of Sustainability'

The focus of the year will be on environmental sustainability by inspiring collective action through a nationwide commitment towards sustainable practices, in line with the UAE's national strategy

By CCME Content Team



His Highness Sheikh Mohamed bin Zayed Al Nahyan

UAE President His Highness Sheikh Mohamed bin Zayed Al Nahyan has announced that 2023 will be the "Year of Sustainability", according to an Emirates News Agency (WAM) Press release.

The "Year of Sustainability" will include several initiatives, activities and events that draw upon the UAE's deep-rooted values of sustainability and the legacy of its founder, the late Sheikh Zayed bin Sultan Al Nahyan, WAM reported. It will also focus on environmental sustainability by inspiring collective action through a nationwide commitment towards sustainable practices, in line with the UAE's national strategy, bringing together everyone who calls the UAE home, to work towards a prosperous future, WAM reported.

The year also aims to showcase the UAE's commitment towards fostering a global collaboration in seeking innovative solutions to challenges, such as energy,

climate change and other pressing issues related to sustainability, WAM reported.

The year-long initiatives are overseen by H.H. Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister and Minister of the Presidential Court; and H.H. Sheikhha Mariam bint Mohamed bin Zayed Al Nahyan, WAM reported.

President His Highness Sheikh Mohamed bin Zayed said: "Sustainability

has been a fundamental principle in the United Arab Emirates since its unification. The nation continues to serve as an exceptional model for environmental conservation and resource management. The late Sheikh Zayed was a global leader in environmental and climate action, leaving behind a legacy that we continue to follow today.

"Today for Tomorrow embodies the UAE's approach and commitment to sustainability and its responsibility to protect the future. By working, making efforts and initiating actions today, we are ensuring that we leave behind a legacy of stewardship for future generations, just as our ancestors did for us."

His Highness also emphasised that the Year of Sustainability has particular significance, as the UAE prepares to host the 28th United Nations climate change summit, Conference of Parties (COP28). He stated that the UAE is determined for COP28 to set a precedent

in the collective global efforts to address climate change.

His Highness also invited community members and institutions to engage with the initiatives and activities of the Year of Sustainability and come together in collective efforts that lead the nation towards a more sustainable future.

The "Year of Sustainability" solidifies the UAE's commitment in addressing current challenges and promoting sustainable practices at an individual and community level, WAM said. Notable examples include the "Net Zero by 2050 Strategic Initiative", which details the country's commitment to promote environmental protection, and its efforts to create thriving communities ideal for living and working, WAM reported.

The announcement comes following the successful conclusion of Abu Dhabi Sustainability Week 2023, which saw the participation of numerous state leaders and officials, worldwide, WAM said. This further cements the UAE's position as a leader in promoting sustainability awareness both domestically and internationally and reinforces its commitment to tackling the challenges associated with it, WAM reported.

The UAE has long been a leader in promoting clean energy and building effective partnerships for the benefit of the global community. One notable partnership is The UAE-US Partnership for Accelerating Clean Energy (PACE), which will catalyse USD 100 billion in financing and other support in addition to deploying 100 new gigawatts (GW) of clean energy in the United States, UAE and emerging economies around the world by 2035.

This report was filed by Rola AlGhoul/Esraa Esmail of WAM.

Samsung MENA hosts 'Air Solutions Day' for HVAC industry consultants

Company presents its 360 Cassette, WindFree and DVM S2 technologies during the event

By CCME Content Team



featured three prominent consultants from the UAE, Turkey and Pakistan. The discussion highlighted Samsung's role in helping consumers achieve greater energy conservation with its sustainable and eco-friendly innovations, the company said. The discussion also addressed the challenges and opportunities in the sector across the MENA, favourable HVAC sustainable future systems, and Samsung's innovative products that support global development efforts.

The consultants that attended the event also toured Samsung MENA's Enterprise Business Centre and the Air Solutions Training Center, which the company described as one-of-its-kind MENA training academy that enables visitors to experience the company's innovative air solutions. The event concluded with a visit to SmartThings Home, which the company said features its award-winning product categories and different SmartThings-powered zones representing the future of residences.

Okan Tutcu, Director HVAC - MENA Regional HQ, Samsung, speaking on the occasion, said: "The spirit of innovation is what maintains Samsung's products, including HVAC systems, as industry changers over the years. The innovative technologies that Samsung introduced to the HVAC industry in recent years are a testament to our supremacy across all fields. Samsung will continue investing in the HVAC industry and will always offer the best solutions to our business partners."

SAMSUNG Electronics conducted its 'Air Solutions Day' event on January 16 in Dubai, during which it hosted consultants invited from across the MENA region.

Making the announcement through a Press release, Samsung said its AC professionals presented its innovative HVAC technologies, which include 360 Cassette, WindFree and DVM S2 during the event.

Describing the 360 Cassette as featuring an award-winning bladeless technology design, Samsung said the equipment can evenly circulate air and cool every corner comfortably. With this technology and the use of three booster fans, the cool air can flow at much lower angles, as these fans create a lower pressure area around the circular outlet, which leads to the cool air coming out more parallel to the ceiling and dispersing across a wider area, Samsung said.

According to Samsung, the DVM S2 Variable Refrigerant Flow (VRF) outdoor air conditioning unit features innovative technologies, and is compatible with its WindFree indoor units, providing exclusive WindFree cooling without the discomfort of direct indoor cold airflow. The WindFree technology eliminates harsh cold draughts and disperses air through thousands of micro holes at a speed of less than 0.15 m/s, which helps in creating a still air

environment, Samsung said.

The DVM S2 features Active Artificial Intelligence, which enables the system to learn usage patterns from recent cooling or heating operations and create optimised cooling and heating performance, using advanced AI algorithms, Samsung claimed. Moreover, the unit can detect refrigerant leaks in real-time and can provide the best timing for defrost operations, resulting in increased comfort during heating, Samsung said.

The event was also an opportunity to hold a panel discussion, titled "Tech Talk: HVAC of Today & Tomorrow", which



Empower holds first meeting with MEP consultants for 2023

District Cooling utility provider briefs them on operations of its new systems in District Cooling

By CCME Content Team

EMIRATES Central Cooling Systems Corporation (Empower) held the first meeting with its MEP consultants for the year, with the aim of highlighting new developments in the District Cooling sector and of familiarising them with its practices related to District Cooling operations. Making the announcement through a February 1 Press release, the District Cooling utility provider said it used the meeting to also showcase its technologies used in the production and distribution of chilled water, and to discuss different ways to apply its systems to enhance the District Cooling services provided to the public.

During the meeting, Empower said, its professional leaders highlighted its sustainable business model, developed using national and international expertise. The meeting also featured a discussion with consultants on ideas, challenges and opportunities it has experienced and explored over the past years, Empower said. During the meeting, Empower said,

it also presented the challenges it faced upon applying its plans to invest in modern technologies to ensure a complete, integrated, reliable and sustainable ecosystem in all stages of District Cooling.

Empower said it concluded the meeting with a field tour, which included a visit to the Dubai Healthcare City District Cooling Plant, to brief the consultants on one of the company's unprecedented success stories in securing environmentally friendly and sustainable cooling services with economic, social and climatic gains, in line with the direction of the nation and the city in transforming to a green economy.

H.E. Ahmad bin Shafar, CEO, Empower, said: "Knowledge is the real wealth in all areas of life, and the knowhow that Empower has gained with its accumulated experiences is not exclusive to it, but it is available to all those engaged in the industry based on our moral, professional and societal commitment towards our country, our



H.E. Ahmad Bin Shafar

city and our strategic partners in this strategic and vital industry and our wish to cooperate with everyone to achieve the highest levels of quality and best practices in its management and delivery. Thus, our ultimate goal is to develop new visions for the District Cooling industry, and to achieve significant economic, social, environmental and climatic gains.

"We are committed to research and bring development in everything related to District Cooling operations. We spare no effort or time in harnessing modern innovations in order to effectively contribute to supporting the national strategy for innovation, as well as continuing to provide outstanding quality services to residents or developers and owners of facilities."



ASHRAE, Kuwait University to conduct 8th International Conference on Energy Research and Development

Announces call for abstracts, adding that the deadline for submitting them is March 1

By CCME Content Team

ASHRAE announced that abstracts are now being accepted for the Eighth International Conference on Energy Research and Development, to be held from November 28 to 30, 2023, in Kuwait University City, Kuwait. Making the announcement through a Press release, ASHRAE said the Conference Cultural Centre, in the University City, will be the venue. The deadline to submit the abstracts is March 1.

Organised by ASHRAE and Kuwait University, the conference will bring together energy planners, researchers and users to optimise the utilisation of basic energy resources in the major energy-consuming sectors in the arid regions of the Arabian Peninsula, ASHRAE said.

Walid Chakroun, Conference Chair, said: "This conference is a great opportunity for networking, where one gets to share ideas, exchange valuable feedback and connect with like-minded



people, or with those of similar topics of interest. It is a link to develop oneself with the state-of-art technology and research milestone. Attending this conference plays a vital role in professional as well as personal development."

According to ASHRAE, the steering committee seeks papers focused on the following topics:

- Energy Conversion and Management
- Energy Conservation
- Fuels and Alternatives
- Energy Policy and Planning
- Combined and Co-generation Energy Systems

- Air-conditioning and Refrigeration Systems
- Energy and Environmental Issues
- Energy and Sustainable Development
- Renewable Energy Technologies
- Energy Storage
- Thermodynamics, Heat Transfer and Fluid Dynamics
- Thermodynamic Optimisation and Exergy Analysis
- Plant and Facilities Mechanical Integrity
- Emerging Energy Technology
- Material Design and Analysis

Abstracts should consist of 300 words or less, ASHRAE said, adding that if accepted, final conference papers (eight pages, maximum) are due on June 12. Abstracts, ASHRAE said, can be submitted here. It suggested that those interested in the conference and the call for abstracts could get more information by visiting ashrae.org/ICERD8.

Emerson joins Eurovent Middle East

HVACR association says Emerson coming on board adds to a growing group of industry players supporting joint initiatives in the fields of regulatory development, education and awareness raising

By CCME Content Team

EUROVENT Middle East said global technology and engineering company, Emerson has become its newest member. Making the announcement through a January 17 Press release, Eurovent said that by becoming a member of the HVACR association, Emerson has joined a growing group of industry players supporting joint initiatives in the fields of regulatory development, education and awareness raising.

Eurovent said Emerson comes with 130 years of corporate history. With more than 85,000 employees and 170 manufacturing plants the world over, it

provides innovative solutions for customers in industrial, commercial and residential markets, Eurovent said. Emerson's Commercial and Residential Solutions business is dedicated to human comfort and health, protecting food quality and safety, advancing energy efficiency and creating sustainable infrastructure, Eurovent said.

Jaya Kumar, Vice President, Emerson Commercial and Residential Solutions - Middle East & Africa, said: "We have followed the establishment and development of Eurovent Middle East from its beginning. The association

has demonstrated its commitment and capability of providing an open, transparent and effective platform for joint initiatives of the industry. Emerson has always emphasized corporate social responsibility. With our education and training activities, we support critical capacity building in the region. The time has come to join forces with all the other members for the benefit of the region's socio-economic development."

Tariq Al Ghussein, President, Eurovent Middle East, welcoming Emerson's decision, said: "We are proud to receive the commitment of Emerson. The challenges of our region and our time can only be addressed by all involved stakeholders. Joining hands and working together enables us to create a better impact on the markets, become a trusted partner for governments, and shape the future of the region together. It allows us to provide the right guidance for a more energy-efficient and sustainable future for us all."

Taka Solutions launches Cooling-as-a-Service

Company describes initiative as revolutionising cooling in the UAE through the disruptive pay-per-use cooling model

By CCME Content Team



Taka Solutions and Green Coast Real Estate officials during the signing ceremony

ENERGY services company, Taka Solutions launched Cooling-as-a-Service (CaaS), which it described through a Press release as a disruptive pay-per-use model to decrease energy consumption and associated costs at chiller plants across the UAE. With CaaS, customers can eliminate upfront investment and operational expenditure and instead pay per unit of cooling consumed, the company said.

CaaS is an innovative pay-per-use business model that enables customers to base their decision on lifecycle cost rather than on the purchase price of the equipment, Taka said. CaaS enables end customers to pay for the cooling they receive rather than the physical product or infrastructure that delivers the cooling, Taka said, adding that it provides its CaaS customers an opportunity to eliminate all cooling-related capital and operational expenditure, including utility bills, unforeseen costs associated with equipment breakdowns and more. Taka said it will take full responsibility to install and maintain the chiller plant, in return for a pre-agreed charge for the actual supply and consumption of cooling. Combined with a commitment to meet the customers' obligations, the company's goal is to have the customers' chiller plant

operating at maximum efficiency and reliability, Taka said.

According to Taka, the scope of its CaaS service includes combinations of total chiller and auxiliary equipment replacement, with brand new, state-of-the-art equipment and technology, retrofit, upgrade, refurbishment and full recommissioning of existing equipment, redesign of pump and pipework layout, as well as numerous other energy-saving opportunities. Additionally, customers can offload all liabilities and risks associated with their chiller plant, including equipment breakdowns and maintenance, Taka said.

Furthermore, customers can access the latest in cooling technology with direct technical support from the market leaders in energy efficiency, own an improved and efficient chiller plant, increase the value of their assets, substantially reduce carbon footprint and qualify for green credentials, Taka said.

Taka said it has already signed its first CaaS project, with Green Coast Real Estate (GCRE), for the client's 11-storey residential building, in Port Saeed, in Deira, Dubai. As part of the project, Taka said, it will be financing the replacement of the chiller plant with no capital expenditure to GCRE. The plant

will also be operated and maintained for the contractual duration of 15 years with no operational expenditure to GCRE, after which the plant will be handed back to GCRE at no further cost, Taka said. In addition to avoiding the cost of installing a new chiller plant by GCRE, the new equipment will generate an overall savings of more than AED 2 million in utility costs, reducing the total energy expenditure and carbon footprint, Taka said.

Mohammed Abdulghaffar Hussain, Chairman, Taka Solutions and Chairman and Co-Founder, Positive Zero, said: "Taka Solutions has always been at the forefront of the energy-efficiency industry, and the launch of its Cooling-as-a-Service model solidifies Taka Solutions' position as the leading energy services company in the UAE. The introduction of CaaS follows the recent launch of Positive Zero, an integrated energy transition platform and parent company to Taka Solutions. Positive Zero aim to provide fully financed sustainable energy solutions, enabling the transition to a net-zero economy. With this project expected to reduce energy consumption and carbon footprint of the development, we strongly believe more projects of this nature can contribute to achieving the UAE Net Zero by 2050 strategic vision."

Mansoor N Hussain, CEO, GCRE, said: "We are excited to sign our first Cooling as a Service (CaaS) contract in the UAE with Taka Solutions for one of our major developments in Dubai. As a customer, we enjoy several benefits, such as zero investment in optimizing our chiller plant, and no operating expenditure, as all cost of utilities and maintenance is Taka Solutions' responsibility. This allows us to focus on our core business areas and leave our cooling needs to the experts. With a forecasted reduction of over AED 2 million in utility costs, we believe this type of pay-per-use financial model meets the needs of the energy industry in the UAE. We have no doubt the CaaS model with Taka Solutions will disrupt and transform the cooling industry in the UAE."

Carrier launches AquaSnap 30RC air-cooled chiller

Company says system helps maximise building space while delivering efficiency

By CCME Content Team

CARRIER on January 10 introduced the all-new AquaSnap 30RC air-cooled scroll chiller. Making the announcement through a Press release, the company claimed the system features Greenspeed® intelligence and R-32 refrigerant, with best-in-class energy efficiency while delivering quieter operation within a tiered design for a broader operating range and design flexibility.

According to Carrier, the 30RC was developed with advanced features to ensure performance and efficiency with a new compact tier unit design, providing customers with the option to choose the chiller that fits their business and sustainability needs. The optimisations, the company said, boost the integrated part load values (IPLV) up to 18 for a wide range of applications from 60 to 150 tons using R-32 refrigerant to further reduce impact on the environment.

The chiller's new compact tier design, with a physical footprint less than standard chillers, enables it to be deployed where space is tight without compromising performance, the company said. With the high cost of real estate, Carrier developed the smaller footprint chiller for a range of applications where optimum space utilisation is crucial, the company added.

Sathya Moorthi, Managing Director, Carrier Middle East, speaking on the occasion of the launch, said: "With the development of the 30RC air-cooled chiller line, we continue our commitment of improving efficiency and keeping the flexibility and high efficiency we already offer with our legacy models. This allows customers to reduce energy costs and



have access to different coil and evaporator configurations, all in a small footprint. These benefits of the AquaSnap 30RC tightly align with our customers' sustainability goals, energy needs, cost pressures, changing business requirements, comfort needs and health concerns."

Saudi Arabia to host HVAC R Expo

The 2023 edition will align the industry with Saudi Vision 2030 by unleashing new opportunities, contributing to the vibrant landscape of the Kingdom, dmg events, the organising company, says

By CCME Content Team

THE Riyadh Front Exhibition & Conference Center, in Saudi Arabia, will be playing host to the latest edition of HVAC R Expo Saudi from February 18 to 21, dmg events, the organising company, said through a January 25 Press release. The 2023 edition will align the industry with Saudi Vision 2030 by unleashing new opportunities, contributing to the new and vibrant landscape of the Kingdom, dmg said.

HVAC R Expo Saudi, co-located alongside The Big 5 Saudi, during its four-day run, will bring together more than 700 exhibiting companies from around 40 countries, showcasing over 15,000

innovative products and solutions, dmg said. It will host 11 country pavilions, including China, Egypt, Germany, Greece, Kuwait, India, Poland, Spain, Turkiye and Qatar, dmg added.

According to dmg, the event will focus on four major product segments, as well as host five co-located events addressing key construction sectors. The Big 5 Saudi, for instance, will bring together the construction industry in the Kingdom. Stone & Surface Saudi Arabia will connect the stone industry and the FM Expo will focus on providing facilities management professionals with new technologies to support them safely maintain their assets.

The newly launched Windows, Doors & Façades and Saudi Glass events have been created exclusively for façade professionals and are expected to bring together over 75 brands and over 1,000 latest products and solutions from the façade and glass industries, dmg claimed. The one-day Façades Talks programme will feature some of the biggest names in the industry, delivering CPD-certified talks along with interactive workshops, dmg said.

HVAC R Expo Saudi, The Big 5 Saudi and its co-located events are expected to bring a strong line up of local and international leading manufacturers and suppliers, including Carrier, Coolex, Systemair, Dosan, Rheem, NAFFCO, Diesel Machinery, Steeco, Schnell, Al Majal Al Arabi Group Company, Dar Almasalla, Al Zarabi Technical Trading Company, Al Mawarid Manpower Company, Schüco, Alumil, Gutmann, Reynaers, Technoform, Talco, Aluk, TechFire and Al Moosa Doors, dmg said.

ISHRAE launches UAE chapter

Marks the occasion with a conference that discusses a potpourri of HVACR-related issues

By Surendar Balakrishnan | Editor, Climate Control Middle East



ISHRAE launched its UAE chapter on January 25 in Dubai. It marked the opening with an oath-taking ceremony of the chapter's newly appointed office-bearers and with a conference, called Urjavarán, comprising a series of discussions revolving around HVACR-related issues.

Nishant Gupta, Vice President (Technical), ISHRAE, led the oath-taking ceremony, which saw senior HVACR industry stakeholders in the UAE assume office, with Moan Abraham as President, Agnel D'Souza as President-Elect, S S Swamy as Treasurer and Ajith Abraham as Secretary.

Gupta, then giving the opening address, spoke of how it was a proud moment for the 42-year-old organisation to establish its 51st chapter, in the UAE. In the coming months, he said, the ISHRAE chapter expected to launch different initiatives in the country.

Moan Abraham, speaking after him, elaborated on the birth of the chapter, which to date has enrolled 125 members in the UAE in the span of four months. "Our aim is to reach 300 members by the end of the calendar year," Abraham said, adding that in the coming months, the chapter planned to conduct a workshop on commissioning, a Distinguished Lecture Series, webinars, product presentations, and training programmes on the importance of psychrometric chart, on heat load calculation, environmental air quality and on ISHRAE-certified programmes. In addition, Abraham said, the chapter would be holding training sessions for students.

A key area of focus, Abraham said, would be refrigeration, against a backdrop of a general paucity of technical

programmes on the subject in the country.

N.S. Chandrasekar, National President for the 2022-2023 term, ISHRAE, making a presentation, spoke of how ISHRAE has over the years built a membership of 20,000 professionals and 7,000 students. ISHRAE, he said, has 49 chapters in India, with the 50th, in Warangal, in the southern Indian state of Telangana, at a formative stage. Pointing out that the first overseas chapter came to be established in Bangladesh, in 2022, he said it was a matter of pride to establish the second in the UAE, with one in Qatar to follow. He also said that ISHRAE has been receiving requests for chapters from the HVACR communities in Nepal, Sri Lanka, Kenya and Nigeria.

Speaking on ISHRAE's theme of the year, 'Prithvi, Pariyavaran, Parivarthan', which stand for Earth, Environment, Transformation, Chandrasekar said it aligned with India's climate action, including the country's net-zero target by the year 2070 and with that of the UAE, which has made a commitment to become net zero by 2050, is a host of the impending COP28 Summit and has a hydrogen roadmap. ISHRAE, as a technical organisation, is one of the largest influencers and can do a lot towards net zero, he said. "We can make sure that we from the HVAC field can contribute," he said. "In India, we work with the Bureau of Indian Standards, the Environment Protection Ministry and with the Star Labelling programme. We, as ISHRAE, give inputs and work with industries, architects, academia and end-users. We are looking at the prospect of being able to spread the knowledge of HVAC here."

Chandrasekar said ISHRAE, over the years, has established Technical Standards on VRFs, AHUs, IEQ and on commissioning. The standard on commissioning, he said, is one of its kind, he added.

Chandrasekar, just like Abraham before him, spoke of the technical programmes in the UAE chapter's pipeline. Emphasising on refrigeration as a subject, he said the chapter has outlined topics related to refrigeration, including heat load estimation, selection of components (insulation panels, evaporators (heat exchangers), condensing units, refrigeration racks, air-cooled condensers and water-cooled condensers), piping design, best practices for installation and commissioning, and operation and maintenance.

Speaking after him, K Kalimuthu, Consul (Economic, Trade & Commerce), Consul General of India, Dubai, spoke of the importance of refrigeration in the context of food losses. "We lose 30%-40% from the point of production to the point of consumption of food," he said. "So, imagine if we could provide a solution. One unit saved is one unit produced."

Kalimuthu also spoke on the subject of standards – on how they could become barriers to trade. He said the UAE and India have agreed to work together to understand to ensure technical standards do not become barriers. The ISHRAE chapter, he said, could help in cooperation and increased trade. Indian trade relating to HVAC equipment, he pointed out, is not substantial, considering that we are a premium trading partner of the UAE. This could change, he said.

The conference track of the event included a panel discussion on cross-sectoral partnerships for positive climate action. It also included a panel discussion on achieving energy efficiency and occupant health through VRF technology.

The event was sponsored by Daikin (Presenting Partner); Carrier (Host Country Partner); HTL Aircon (Engineering Solutions Partner); Leminar and Rheem (Knowledge Partners); Mexflow (Copper Partner); Bry-Air and DRI (India Innovation Partners); Blue Star (Sustainability Partner); Edgetech (Air-Handling Solutions Partner); and ABL Technical Services, Advance Valves, Daspas, Grundfos, HisenseHVAC, Humidin|Casilica and SRM Tec (Strategic Partners). Climate Control Middle East magazine was Media Partner of the event.

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Eurovent publishes two new air filter recommendations

Recommendation 4/24 – together with the earlier issued Recommendation 4/21 and with the now introduced 4/25 – forms a set of documents for evaluation of energy consumption and energy efficiency of air filters, Eurovent says

By CCME Content Team



THE Eurovent Product Group 'Air Filters' (PG-FIL) has released its new Recommendations: 4/24 Energy consumption evaluation of air filters for general ventilation purposes and 4/25 Energy consumption evaluation of air filters for general ventilation in NRVUs in the context of Ecodesign.

Making the announcement through a January 24 Press release, Eurovent said the purpose of Recommendation 4/24 is to provide a generic methodology for estimating energy consumption of air filters for general ventilation under actual operating conditions, taking into consideration wide range of airflow rate, actual filter dimensions, approach to the filter change (condition-based and time-based method), actual operating time and actual fan efficiency. The document is built on the methodology defined in Eurovent 4/21 and implements the ISO 16890 classification, as well as its testing methods, Eurovent said. Recommendation 4/24, together with Eurovent 4/21 and Eurovent 4/25, forms a

set of Eurovent documents for evaluation of energy consumption and energy efficiency of air filters, Eurovent said.

According to Eurovent, the differences between the scope of respective recommendations are the following:

Eurovent 4/21 is an integral recommendation for energy rating and filter performance comparison at standard reference conditions as a basis for the certification programme

Eurovent 4/25 is a simplified version of this recommendation to propose a consistent evaluation of energy consumption of air filters in the revised Regulation (EU) 1253/2014.

Marc Schmidt, Chairman, Eurovent PG-FIL, said: "In an excellent team effort of the Eurovent Product Group 'Air Filters', the proven Recommendation 4/21 was adapted to new requirements and aspects. I am certain that these Eurovent Recommendations for assessing the energy consumption of air filters will be useful guidelines in the HVAC industry and will be widely used. As Chairman

of the Eurovent PG-FIL, I would like to express my gratitude to all members who have contributed to their development."

According to Eurovent, the recommendations are addressed to all HVAC professionals dealing with ventilation systems, particularly designers, facility managers and manufacturers of equipment incorporating air filters. The documents were published by Eurovent and were prepared in a joint effort by participants of the Product Group 'Air Filters' (PG-FIL), which represents a vast majority of manufacturers of these products active on the EMEA market, Eurovent said, adding that they may be downloaded free of charge in the Eurovent Document Library:

- Eurovent 4/24: Energy consumption evaluation of air filters for general ventilation purposes
- Eurovent 4/25: Energy consumption evaluation of air filters for general ventilation in NRVUs in the context of Ecodesign requirements

Heat Exchange as a Service

Kelvion launches pay-per-use heat exchanger business; company says heat exchangers can be leased in addition to being sold

By CCME Content Team



KELVION launched a pay-per-use service of its heat exchangers, saying that they can now be leased in addition to being sold. Making the announcement through a January 24 Press release, the company said the initiative comes at a time when businesses are carefully considering investing in production equipment and when it is common to hear such questions as: ‘Can I afford the new acquisition?’ ‘What do I do during periods of low production?’ ‘How do I react to economic fluctuations?’ Smart financing models, such as the pay-per-use approach, can reduce the financial risk in such cases, Kelvion said. This is where “Heat Exchange as a Service” comes in, the company said, adding that it is offering heat exchangers that can be billed on a pay-per-use basis – that is, based on a fixed hourly rate, in addition to its established sales business.

Kelvion said it has entered a strong

partnership with linx4, the market leader for PPU financing for industrial equipment, who will handle the billing of Hx as a Service.

At present, issues such as inflation, geopolitical tensions and rising energy prices are dominating everyday business life, Kelvion pointed out. With “Heat Exchange as a Service,” users can integrate heat exchange solutions for heat recovery into their processes in a plannable and cost-efficient manner without having to invest CAPEX, the company said. The idea behind this is simple but effective: Instead of buying the heat exchanger, customers only pay for the actual use, the company said. This creates maximum cost and process efficiency, the company said. Furthermore, thanks to the Internet of Things, consumption data, among other things, can be recorded and used almost in real time, the company said.

Kelvion said customers can choose between three different packages that include different maintenance options – standard, service, smart. Every package will provide customers with the latest heat exchanger technology from Kelvion, the company said. Costs for services required for commissioning the equipment are already included in all packages, the company said. Intelligent additional functions such as performance monitoring, predictive maintenance or tracking of CO² reduction can be added, the company said. “We want our customers to rely on a carefree heat exchange service so that they can focus on their core processes,” said Stefan Kleinjung, Project Manager, Kelvion. “We ensure the highest reliability and efficiency of the heat exchange solutions with our selectable maintenance offerings. This can avoid unplanned shutdowns caused by leakage or inefficient operation due to fouling.”

With “Heat Exchange as a Service”, Kelvion said, it is able to create a resource-efficient offering based on the circular economy principle. A modular design reduces the use of resources to a necessary minimum, it said, adding that regular maintenance extends the service life of the equipment used.

“It was important to us to ensure a maximum product lifecycle,” Kleinjung said. “Our Heat Exchanger design combines a high level of standardisation with an outstanding flexibility to design customised solutions to meet customer demands. Thanks to the modular design, individual parts can be replaced at low cost. Should our equipment ever be irreparably damaged, we ensure that it is properly fed into the recycling system.”

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Sensitron celebrates impending 35th anniversary through a rebranding exercise

Manufacturer of gas detectors says the milestone is an opportunity to launch its new brand, which reflects its strategy and current identity



By CCME Content Team

A **NNOUNCING** that it is turning 35 in 2023, Sensitron, manufacturer of gas detection systems and part of the Halma Group, said it is marking the occasion with a rebranding exercise. Making the announcement through a January 17 Press release, Sensitron said it has sold over 12,250,000 gas detectors and control panels, worldwide, and that the 35th anniversary is an opportunity to launch its new brand, which better reflects the company's strategy and current identity.

Daniele Cresseri, CEO, Sensitron, said: "In 1988, Sensitron was a pioneer in the field of gas detection. This spirit continues to drive us, especially by investing in

innovations that can meet the challenge of time. At our customers' side, we find answers to the energy transition, which we address both in terms of product development and in terms of pre- and after-sales support. For this, our logo changes: In the handshake, we see commitment made, but also collaboration, doing together the best we can without compromise."

Marco Penso, Head of R&D, Sensitron, said: "We are continually researching new technologies and methodologies to ensure our customers are as safe as possible when using ever-changing gases for needs related primarily to environmental conservation."

Sensitron, as a part of Halma Group, highlighted its focus alongside customers in the challenge of energy transition for the safety of people and the environment – a focus, it said, aligned with that of Halma Group's vision. Raffaella Capelli, Product Manager, Sensitron, said: "For more than 30 years, we have been offering products to the market that ensure the protection of people and the environment. We have always considered safety to be a primary asset, in total harmony with Halma's vision of contributing to a safer world for all. We are proud to be part of a global group of life-saving technology companies."

InEight introduces software suite on sub-contractor performance

Company says enhancements to its construction project management platform bring better forecasting accuracy, improved field collaboration, and more visibility and control over subcontractor performance

By CCME Content Team

I **NEIGHT** Inc., which provides construction capital project management software, has announced its latest suite of software innovations, which are designed to increase forecasting accuracy, and improve field productivity and subcontractor management.

Making the announcement through a Press release, InEight said the latest updates provide contractors with a higher level of forecasting accuracy based on up-to-date project progress, including subcontractor activity. This allows for quick reactions to financial and productivity challenges, providing greater confidence to project owners, the company said.

According to InEight, uncertain

economic conditions and disruptions in the construction supply chain are putting increased pressure on contractors and owner/operators to produce accurate project forecasts. InEight is building on its already strong legacy in cost forecasting with significant new capabilities in the areas of time-phased forecasting, custom forecasting methods and resource-based forecasts, the company said.

In addition to out-of-the-box forecast methods, InEight users can now configure the best equations to automate forecast calculations for the different types of work through different stages of completion, the company claimed. "There is no one-size-fits-all approach when it comes to forecasting, even within a single project,"

said John Upton, Director, Project Cost Management. "InEight helps contractors and owners better capture field data and measure progress."

According to InEight, the platform enhancements also drive increased productivity through more efficient collaboration between the office and the field. Scope and quantities, productivity goals and more are easily communicated in daily digital plans to field crews and subcontractors, the company claimed. Controlled transparency allows teams to identify and troubleshoot challenges, the company said, adding that this leads to a higher level of profitability potential.

Additionally, InEight made it easier to get full visibility into subcontractor costs, the company said. With line of sight to both committed and uncommitted costs, users can compare the variance between the planned cost and the actual costs, it added.

Brad Barth, Chief Product Officer, InEight, said, "Our goal is to connect scope, cost, and schedule on a single platform, giving project stakeholders the ability to collaborate effectively and deliver projects with predictable results."

ISH China, CIHE to return in May 2023

Organisers speak of restructured product zones supporting industry growth

By CCME Content Team

ISH China & CIHE – China’s international trade fair for Heating, Ventilation, Air-Conditioning, Sanitation & Home Comfort Systems – will take place from May 11 to 13 at the China International Exhibition Center (Shunyi Hall), in Beijing.

Making the announcement through a January 30 Press release, the organisers, Messe Frankfurt (Shanghai) Co Ltd and CIEC GL events (Beijing) International Exhibition Company, said the show will once again present fairgoers with trend-setting HVAC, plumbing, smart heating and home comfort technologies and products in the Chinese and wider Asian markets. The upcoming edition will continue to home in on the “Energy”, “Water” and “Life” themes, which are in line with China’s national development strategies, the organisers said. In total, the fair is expected to welcome over 1,300 exhibitors across 106,800 square metres of exhibition space, the organisers added.

The ‘carbon peak’ and ‘carbon neutrality’ policies, highlighted in the Chinese government’s 14th Five-Year Plan, underlines a commitment by the country to generate energy through reform and innovation, the organisers said. These new reforms offer strong prospects not only to China’s renewable energy and energy storage markets but also inherently changes China’s modern energy systems while bringing new opportunities to the HVAC industry, particularly for the heat pumps market, the organisers said. To adhere to the government’s initiatives and energy infrastructure optimisation targets, manufacturers are actively developing energy-efficient HVAC solutions, specifically refining heat pumps and revolutionary energy storage technologies to meet the stringent carbon emission regulations, the organisers said. By recognising the benefits in the efficiency and flexibility of heat pump technologies, paired with the central government’s goal to strengthen domestic capabilities in all core energy storage technologies, intelligent and green HVAC technologies will continue to be key development focuses for manufacturers, the organisers said.

Apart from the booming heat pump market in China, according to the 2022 China Heat Pump Industry Development Report by the Heat Pump Committee of China Energy Conservation Association, China is currently the largest heat



pump exporter in the world, the organisers said. In the first seven months of 2022, China’s exports of air-source heat pumps increased by 63.7% year-on-year[1]. A recent report, titled the ‘Future of Heat Pumps’, by International Energy Agency, estimated that by 2030, total sales of heat pumps in the EU will reach seven million units[2]. With lucrative opportunities for domestic and overseas markets, renowned brands worldwide require an effective platform to spark new business opportunities, the organisers said. Brands to participate in ISH China & CIHE 2023 include AO Smith, ARCIO, BDR, Beiming Tianshi, DAB, Danfoss, Devotion, Dooch, GREE, Grundfos, Haier, Hailin, Kiturami, Koate, Leo, Micoe, Midea, New Energy, NORTIZ, OUTES, PHILIPS, Phnix, Ploumeter, Rinnai, Shengneng, Shiteng, Siemens, Tongfang, Unbeatable, Vanward and Wilo, the organisers added.

According to the organisers, specialised display areas, zones and pavilions will be a major highlight at ISH China & CIHE. For over two decades, the fair’s thematic zones have become the key component to its success, the organisers said. The 2023 edition will again highlight the returning German Pavilion, Overseas Area, Water Pump Zone, Floor Heating and Cooling System Area and Clean Energy District Heating Area, the organisers said. The 2023 fair will also feature the new Minibox Service Area, located in the Overseas Area. It is a business matching platform at ISH China & CIHE, which aims to bridge domestic suppliers with overseas buyers who cannot physically attend the fair, the organisers said. Running throughout the full duration of the fair, the Minibox Service Area will serve as a

marketing tool for local suppliers to promote their latest innovations and technologies abroad, the organisers said.

ISH China & CIHE’s mission is to showcase some of the world’s most energy-efficient HVAC solutions, the organisers said, adding that they are bringing the mission to the fore through their cooperation with Trade Commissioner Service (TCS) of the Embassy of Canada to China. Canada is renowned for its harsh winters, with many regions reaching sub-arctic climates, the organisers said. To combat the extreme climate, not too dissimilar to the winters in China, Canadian HVAC manufacturers will showcase the latest additive manufacturing technologies and applications in Canada, the organisers said. TCS will group their members in a pavilion to expand their overseas market, and to boost the development for companies in the Chinese HVAC industry, the organisers said.

As an integral part of ISH China & CIHE, a series of concurrent events will be held during the fair, with many well-known HVAC industry experts present to exchange ideas and introduce technologies that will drive the industry forward, the organisers said. Responding to a series of national policy goals, specifically on peak carbon dioxide emissions and carbon neutrality, ISH China & CIHE will offer various summits, seminars and conferences, focusing on the fair’s three core themes: “Energy” (the latest heating solutions paired with renewable energy sources), “Water” (water pumps, valves and fittings) and “Life” (home comfort products and solutions), the organisers said. These events will create a comprehensive platform for fairgoers to expand their knowledge through learning more about the latest industry trends, they added.

According to the organisers, some of the highlighted topics featured at the fair include:

- The China International HVAC Congress (IHVAC)
- China Innovative Heating Products and Technologies
- Fresh Air Systems
- Home Comfort Intelligent Development Forum
- Air Source Heat Pump Heating Technologies
- FCH Cooling & Heating System Technology Forum

{Quoteyard}

We bring you a collection of some of the most interesting quotes, extracted from articles in this issue. In case you missed reading, we recommend you flip back to take full advantage of the insights and remarks, in the context in which they have been presented.

“ The experience of the past few years has made it abundantly clear, and the turbulence of the coming few months will only double down further on the point, that it is only the cultivation of enduring value that will enable an enterprise at any level to survive and continue.”

p06

“ This unnecessary, perplexing and often convoluted rearrangement of clauses, documents, riders and Particular Conditions that undo random parts of the FIDIC General Conditions ultimately result in more time and effort being applied to efficiently resolve any disputes.”

p09

“ In the MENA region, the average salary for HVACR technicians is relatively low compared to other developed countries. Offering higher pay to certified technicians or sponsoring paid training/certification can motivate them to pursue training and certification, which can help them advance in their careers.”

p11

“ In the case of CaaS, when it comes to consumption of chilled water, you pay zero if you don't consume any at all in a month. That said, a minimum consumption has to be met. In certain months, you can take zero chilled water, but on an annual basis, there is an average consumption charge.”

p12

“ Almost all window air conditioners sold in the United States are now manufactured in Asia. In order to fit a greater number of air conditioners onto shipping containers, Asian-manufactured units are built necessarily small, leaving little room for a more robust filter.”

p28

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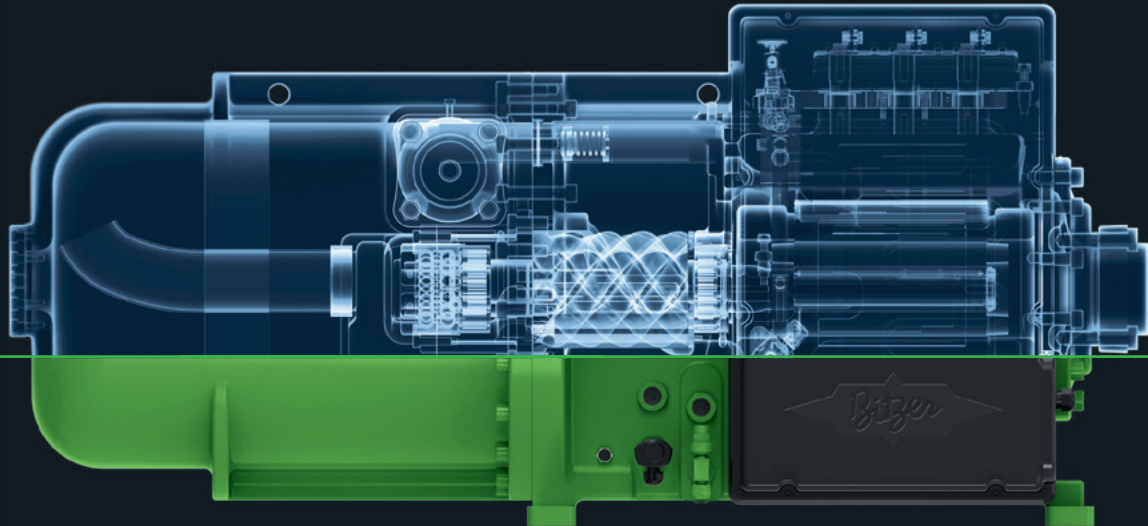
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