

# climate control MIDDLE EAST

KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

January 2025

## 'DISTRICT COOLING

can go up to **60%**  
**PENETRATION'**



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HVAC climate goals are under pressure

*Nabil Shahin, AHRI MENA*

The Cooling Pledge:  
A hedge against global warming

*Dr Rajendra Shende, former Director, UNEP*

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Excess refrigerant can lead to refrigerant migration, oil dilution and component damage

*Dan Mizesko, Dalkia US Chiller Services*

### REPORT

Decoding HVACR2030

### AI & DISTRICT COOLING

The time for autonomous buildings is here

*Salah Nezar, New Murabba*





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**The World's Largest**  
District Cooling Services Provider

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**Surendar Balakrishnan**  
Editor

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# Scarce little

**A**T THE core of green urban development is the need for denser, self-contained communities, as a means to lowering commute-related emissions. With urban populations in the Middle East surging – as per reports, they are expected to grow by 30% from 2020 to 2030 – it is only inevitable that we are going to witness more and more dense clusters.

In 2020, 'density' transformed into a word of dread, though. It meant a higher potential for the spread of disease. Such was the threat that we were encouraged – no, firmly asked – to 'social distance' as one of the strategies to flatten the curve. It was unnerving at a psychological level and flew against the face of green design, though no one could have imagined the scenario when eco-building codes were being written, more than 25 years ago.

Today, we are out of the shadows of COVID-19, and back to living life. Dense is once again in vogue for urban planners. As an MEP community, we need to live with it; only, what are we doing to lessen the possible threat to lives from another pandemic?

Microsoft Co-Founder, Bill Gates, who in 2015 warned that the world was unprepared for a deadly outbreak – a situation that turned out to be true five years later – recently estimated a 10-15% chance of another COVID-like pandemic occurring within the next four years. He went on to say that the world continues to be unprepared for an outbreak, shackled as it is by political differences, barely encouraging global cooperation and a global healthcare infrastructure, which in his opinion, is lagging behind what would be considered adequate.

Our concern, though, is what we as a collective repository of MEP tech knowhow, design and FM strategies are doing to ward off the threat, should the outbreak that Gates is predicting become a reality. Yes, we have ASHRAE Standard 241 as a manual that can prove to be a worthy guide, but are the existing equipment fitted in buildings across the region capable of rising to the occasion? Or, are there gaps in technologies?

If the existing technologies are indeed capable, is that enough? What about the systems and processes? Are FM technicians trained to swiftly switch on to combat mode? Is there a holistic approach that can calm the nerves of building occupants?

The answer, sadly, is a 'no' to almost all the questions. We need to do away with the smugness and the complacency – and the sooner the better.

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KEY PERSPECTIVES ON THE REGION'S HVACR INDUSTRY

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# DECODING HVACR 2030

Eurovent report offers an analysis of the HVACR industry in 2023, explores key trends and challenges, presents a forecast through 2030

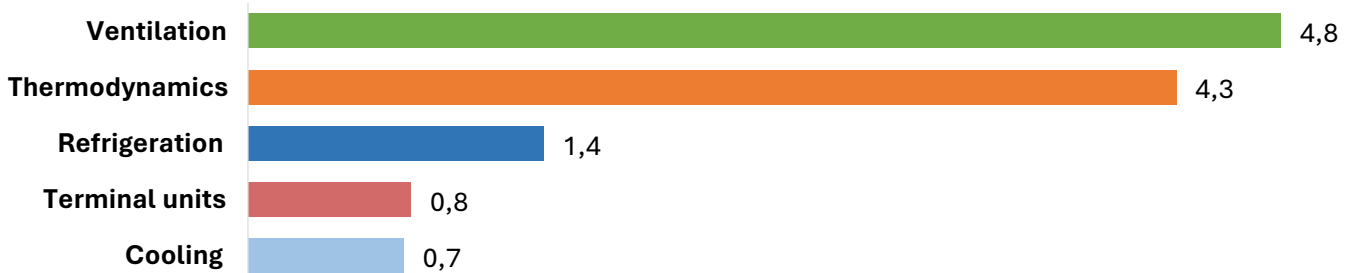


**O**n November 29, 2024, Eurovent Market Intelligence (EMI) published its latest comprehensive report, HVACR 2030, which offers an analysis of the HVACR sector in 2023. This fourth edition of EMI's ongoing series explores key industry trends and challenges, and presents a forward-looking forecast through 2030. The extensive study is intended as a resource for manufacturers, investors and policymakers seeking insights into current market dynamics, emerging technologies and opportunities.

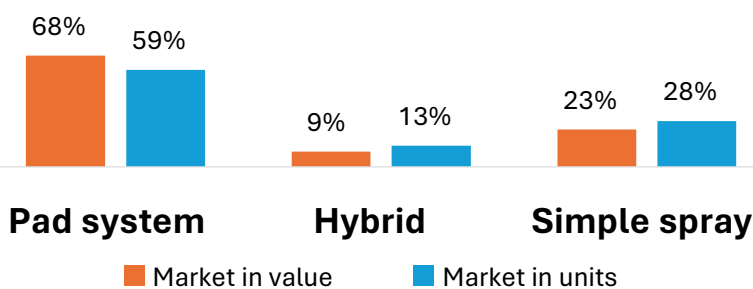
Covering 16 products under five chapters: Cooling, Refrigeration, Thermodynamics, Terminal units and Ventilation, the report focuses on the European market, which includes the EU27, Balkan countries, Norway, Switzerland, Türkiye, UK and Ukraine.

The first section of the report, dedicated to cooling, is a comparison of the cooling tower and dry cooler markets. The dry cooler market amounted to €372.7 million in 2023 in Europe, compared to €210 million for cooling towers, the former being

### 2023 market size in million euros



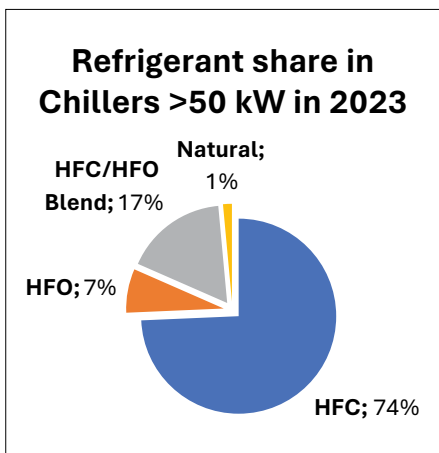
### Distribution of the adiabatic and hybrid market in Europe in 2023



dominated by Germany and the latter by Türkiye. The evolution in value was much more favourable in 2023 for dry coolers, with +15% while that of cooling towers stagnated. This is part of an underlying trend in Europe, which is seeing the dry cooler market progressing more quickly than that of cooling towers. Between the two, the adiabatic and hybrid dry coolers are progressing the fastest, but another confrontation is looming between the simple spray and pad systems. As

can be seen in the graph opposite, pad systems dominate the market, but this trend could be reversed.

The chapter on refrigeration covers the market for coolers and condensers, including CO<sub>2</sub> units. The former totalled 271,000 units, compared to 48,900 for the latter in 2023. The market is dominated by France, followed by Italy and then Germany, but the most interesting point is, of course, the evolution of CO<sub>2</sub> units in Europe. Their proportion increased from 12% in 2019 to 20% in 2023: It is higher in northern Europe – around 50% – but this is not necessarily where the largest markets or the strongest growths are. As for ammonia (NH<sub>3</sub>) units, the large markets are in Spain, Poland and the Netherlands, but once again, the growth potential is elsewhere.



In the chapter on thermodynamics, the market evolution in 2023 showed a positive trend overall, except for the rooftop segment, which experienced stagnation in unit numbers. One of the standout segments of 2023 involved chillers with a capacity above 50 kW, which experienced remarkable double-digit growth, reaching a market value of €1,997.7 million. It must be noted that air-cooled and water-cooled chillers fuelled the expansion. While the long-term analysis by cooling and heating type revealed differing trends, the refrigerant analysis concluded that the phase-down of HFCs in 2023 was rather slow, despite a decline in the use of R-410A.

The report also features an analysis of refrigerants based on capacity,

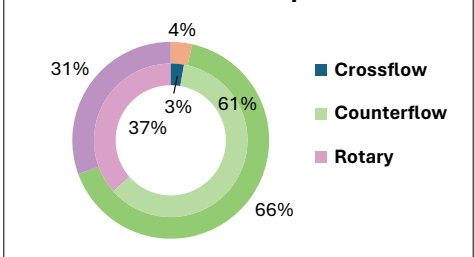
heat source, type of cooling or heating, compressor and application. Additionally, it includes a forecast of the chiller market by refrigerant up to the year 2030.

The CRAC/CRAH market also enjoyed double-digit growth in 2023, with unit sales increasing by 15% and market value rising by 33%, reaching €375.8 million. This growth was primarily driven by the rising demand for high-capacity CRAH units (over 100 kW), which are essential for hyperscale and large enterprise data centres. The units have consistently experienced growth since 2015, although there was a brief slowdown in 2021, due to uncertainties following the pandemic. However, the market rebounded in 2022, and in 2023, there was a 28% increase in sales of large units.

In the section dedicated to terminal units, the report highlights the positive growth of the fan-coil unit market, which was valued at €570 million in 2023. The market is primarily driven by units without casing, which makes up about one-third of the market, slightly surpassing units with casing. The strong growth in 2023 contrasted with the chilled-beam market, which remained particularly stable in both value and structure. In 2023, the sales of chilled beams reached almost 64 million euros, with Sweden alone accounting for more than a third of the amount. A modest decline is expected for the chilled-beam sector through 2030, as fan-coil units – a more cost-effective solution – continue to gain market share.

Finally, in the chapter on ventilation, the report features three products: air-handling units (AHUs), central residential mechanical ventilation with heat recovery (MVHR) and air filters. Only the last product demonstrated stable growing dynamics. Largest in the ventilation sector in Total Europe, the AHU market (around 2.9 billion euro sales) in 2023, grew by +7.5% in euro terms but stagnated in units. The situation by country varied a lot, with only southern Europe and the United Kingdom having a positive evolution in units. The year 2023 for the AHU market was highlighted by turning the rotary into the dominant heat recovery

Market by type of heat recovery in Total Europe



technology in Europe (37% against 32% for the plate), with a high probability of keeping this prevalence in the future. Additionally, the report explores the correlation between the evolution dynamics of AHUs and integrated control and compact units, which both suffered a decrease in 2023, following the weak performance of retail and light-commercial applications.

The central residential MVHR market experienced the worst downturn in the ventilation segment, with a 10% decline, impacted by the crisis in new residential construction all over Europe. Among significant markets, only Spain and the United Kingdom enjoyed a positive evolution in 2023, while northern and eastern Europe dipped by around -20%.

The EMI forecast predicts a gradual recovery, though rather slow and not immediate. Despite the overall decrease, the units with enthalpy slightly increased, but mainly in eastern Europe. Unlike that for AHU, the share of rotary heat recovery in central residential MVHR in Total Europe diminished in 2023, which is likely related to the strong decline in northern Europe, the region where this heat recovery type dominates. Additionally, the report analyses the defrosting strategies used in different European countries and the preferences by the unit's mounting type. [ccme](https://www.ccme.com)

**Editor's Note:** EMI's database, which includes contributions from over 500 participants, formed the foundation for the HVACR 2030 report, providing an understanding of the economic, technological and regulatory factors shaping the HVACR sector. The report spans 154 pages. For more details, readers may contact: [statistics@eurovent-marketintelligence.eu](mailto:statistics@eurovent-marketintelligence.eu)





# REFRIGERANTS REVIEW

A *CLIMATE CONTROL MIDDLE EAST* EDITORIAL CAMPAIGN ON REFRIGERANTS



THE COOLING PLEDGE: A HEDGE AGAINST GLOBAL WARMING



Dear Readers:

**W**elcome to the inaugural issue of the Editorial Campaign on refrigerants! The campaign will run the course of the year and aims to sustain attention on a topic that has assumed criticality following the persistent calls for accelerated climate action.

My team and I at *Climate Control Middle East* magazine are keen on addressing multiple aspects and on providing space for plurality in the best traditions of honest discourse.

The topic of refrigerants is a complex one, with multiple layers to it. The endeavour is to address the range and depth of the subject against the backdrop of an ambitious global transition to climate-friendly and safer refrigerants.

The coverage would include attempting to understand prevailing mindsets and barriers to the transition; the scope and extent of intervention; the regulatory landscape to facilitate the transition; the need for nuance to protect the interests of manufacturers, building owners and other stakeholders; the need for surveillance for protecting fair trade and for safeguarding the health and wellbeing of end-users and technicians; and the need for monitoring progress.

My team and I hope you find the campaign useful and relevant. As always, we look forward to your feedback, which would help us massively in recalibrating our approach, if necessary.

Thank you!

Surendar Balakrishnan  
Editor, *Climate Control Middle East*  
Co-Founder & Editorial Director, CPI Industry

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**climate control** MIDDLE EAST  
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# THE COOLING PLEDGE: A HEDGE AGAINST GLOBAL WARMING

The Pledge, a significant outcome of COP28, in the UAE, offers the HVACR industry a practical edge in addressing the climate crisis, says **Dr Rajendra Shende**

**N**O ONE understands the importance of hedging more than business leaders. A hedge is an investment tactic that is deployed to mitigate possible and potential loss in other investment practices. The Global Cooling Pledge is such a hedge that offers the cooling business, engaged in refrigeration and air conditioning, a practical edge in addressing the climate crisis.

The mind-boggling conundrum of global warming and air conditioning can be stated in simple term: Planetary global warming needs air conditioning, which in turn, warms the planet!

Interestingly, Lee Kuan Yew, the founder and the first prime minister of modern Singapore once stated: "Air conditioning was a most important invention for us, perhaps one of the signal inventions of history. It changed the nature of civilisation by making development possible in the tropics. Without air conditioning, you can work only in the cool early-morning hours or at dusk." He went on to say: "The first thing I did upon becoming prime minister was to install air conditioners in buildings where the civil service worked. This was key to public efficiency."

Yew died in March 2015, 10 months before the Paris Climate Agreement was signed. Little did he know that in the future, energy efficiency of air conditioners would matter as much as the efficiency of public servants.

"Global heating is a cold, hard fact." That's what the World Meteorological

Organization (WMO) said on January 10, 2025. Based on six international datasets, it confirmed that 2024 was the warmest year on record. Known to issue Press statements in rather dry language with a flood of weather statistics, this time around, the WMO issued the following statement: "Global heating is cold, hard fact. Climate history is playing out before our eyes. We have had not just one or two record-breaking years but a full ten-year series." That was a telling statement, if any.

More cooling needs more energy, more energy produces more greenhouse gases, more greenhouse gases result in higher temperature on Earth. Higher temperature needs more cooling for human activities like food preservation, production of medicines, health, comfort and for data centre security for digital technologies, which themselves are showing a phenomenal rise every year. This vicious cycle in cooling is the mega challenge to address what the WMO stated as a 'cold and hard' fact. Clearly, 2024 ended by making it very cold and clear that human developmental activities have disrupted the carbon cycle on our planet.

Seventy-five per cent of the greenhouse gas emissions come from energy generation. Part of that energy is needed for human development, which in turn needs cooling operations. The word 'space cooling', mainly used by the International Energy Agency (IEA), interestingly enough has nothing to do



Dr Rajendra Shende is Former Director, UNEP; Coordinating Lead Author of IPCC-2007, which won the Nobel Peace Prize; and Founder Director, Green TERRE Foundation. He may be reached at [shende.rajendra@gmail.com](mailto:shende.rajendra@gmail.com).

with 'space' applications in the sky, but space within buildings like residences, factories and hospitals which need to be cooled. With several extreme heat events and record high temperatures the world over since the 1800s, much of the global population, mainly in Africa, Middle East and Asia, is at high risk of heat stress, adversely affecting labour productivity, and human physical and mental health.

Growing populations and ever increasing global warming have led to a continuous rise in demand for air conditioning and refrigeration, resulting in higher greenhouse gas emissions. Energy consumption for space cooling has tripled since 1990, though much of the population in poor countries do not have access to air conditioning and refrigeration due to accessibility and affordability. This has left many people deprived of cooling, thereby creating 'cool-inequity'. Sadly, the term 'sustainable cooling' does not internalise such social and just dimensions of cooling.

About 10-15% of global greenhouse gas emissions come from refrigeration and cooling (RAC) applications. The sources of emissions from the RAC sector are two: Direct emissions resulting from the leakages and end-of-life disposal of the refrigerants that have



Global Warming Potential (GWP), and indirect emissions arising out of use of energy for the compressors and allied accessories for refrigeration or air conditioning equipment. Nearly 70% of emissions are indirect, and the remaining are from refrigerant leakages and their open disposal.

The vicious circle of emissions from the RAC sector can be greatly disrupted by transitioning away from highly climate-damaging HCFC and HFC refrigerants to low and, then, zero-GWP refrigerants, and moving towards super-energy-efficient and then clean-energy RAC appliances. Fortunately, the RAC business is on the threshold of realisation that there are, along with climate benefits, significant economic benefits to enhance the energy efficiency and use of clean energy.

However, the time to act is now. During COP28, in the year 2023 in Dubai, under the Presidency of the UAE, all countries that attended agreed to double energy efficiency and triple renewable energy use. A significant outcome of COP28 was the Global Cooling Pledge, joined by 63 countries, including Canada, Kenya, the UAE and the United States. The Pledge marks the world's first collective focus on direct and indirect emissions from cooling, which includes

refrigeration for food and medicine and air conditioning. The Pledge commits countries to reduce by 2050 their cooling-related emissions by at least 68% compared to 2022 levels, along with a suite of other targets, including establishing minimum energy performance standards by 2030.

The goals of the Global Cooling Pledge can be achieved by the RAC Industry, which has been a beacon of successful transformation right from the 1990s, when the Montreal Protocol sounded a clarion call. No one reacted more positively, and with more commitment, than the RAC industry. I believe it can once again rise to the call issued by the Pledge through phase down and then phase out of HFCs; phase out of HCFCs; promoting use of natural and near-zero-GWP refrigerants; monitoring energy efficiency of RAC appliances through digital dashboards and through the use of AI technologies; pledging not to dump outdated appliances in poor countries; creating a fund of its own to help poor countries to enhance energy efficiency and effective monitoring of appliances; tying up with universities to promote the research, development and piloting of actions that achieve use of clean energy in RAC appliances, and through promoting passive, traditional

and natural cooling practices that were followed in Asian and Middle Eastern countries for centuries in the past.

CPI Industry and its flagship magazine, *Climate Control Middle East*, along with Green TERRE foundation, would aim to develop this Editorial Campaign to achieve the goals of The Pledge and invite commitments from industry partners to mitigate RAC-related emissions as per well-meaning targets. The success stories; research papers; and Pledge-related events, including awards and conferences, that would be held in 2025 would find a place in this magazine during the course of the year, and important points extracted from the Campaign would be presented during COP30, in Brazil.

Building a better future for RAC through disruptive changes in behaviour would still validate the statement by the late Yew that the most important invention of the 20th century was indeed the air conditioner. As temperatures and emissions rise, let the commitment of the RAC industry to The Pledge also rise for a world featuring sustainable and just cooling. [ccme](#)

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# THE NEED TO ‘PRESS THE GAS’ ON REFRIGERANTS IS IMPORTANT, BUT...

While it is critically urgent for us to identify and migrate to more climate-friendly and safer refrigerants, given the growing calls for accelerated climate action, what are the barriers for quicker adoption in the GCC region? **Arushi Menon**, Editorial Assistant, *Climate Control Middle East*, has the story...

**W**ITH temperatures often surpassing 50 degrees C in the GCC region, and with growing urbanisation, the demand for cooling is increasing at an exponential rate. Given the impact of air conditioning on global warming, multilateral fora after multilateral fora are calling for urgent adoption of low-climate-impact refrigerants, as part of the strategies they are proposing to accelerate climate action.

The GCC region finds itself in a situation, where on one hand, it still has time to move away from less-climate-friendly refrigerants but finds itself compelled to make the transition much ahead of schedule to align with global calls for greater commitment to safeguarding the climate.

What is the situation on the ground at a granular level, though?

Refrigerant choices in the GCC



Dr Samiullah Khan

region are determined by equipment manufacturers and approval from regulatory bodies. Dr Samiullah Khan, Chief Sustainability Officer, Fakhruddin Holdings, says that as a developer, Fakhruddin relies on the manufacturer of equipment – in this case air conditioners. “With regard to the type of refrigerant used, we focus and ensure that the refrigerant is approved by the Dubai Municipality,” he says.

Another developer, Sobha Group says it focuses on incorporating refrigerants that comply with environmental standards, towards reducing energy emissions and improving energy efficiency. Prasanth Chakkingal, Senior VP, PNC Architects, Sobha Group, says, “Refrigerants with a low GWP have a higher tendency to be mildly flammable.” For example, R-134A, commonly used in chillers, he says, has been largely replaced by



Prasanth Chakkingal

R-1234ze, a more sustainable option, considering it has a low GWP. While using the new refrigerant improves Sobha's environmental profile, most air-cooled chillers are kept outside, which necessitates the presence of robust controls to minimise risk factors, he says.

Speaking on Variable Refrigerant Flow (VRF) systems, Chakkingal says he has seen advancements vis-à-vis refrigerants. While R-410A was previously used due to its non-flammable nature, it had a high GWP, he says. "The replacement for that is R-32, which is slightly flammable," he adds. Manufacturers, particularly in Japan, he says, have implemented smart sensors in their motors to detect refrigerant leaks and reduce risk factors. Adopting this approach, he says, Sobha's focus is on avoiding all avenues of leakage by utilising robust controls and advanced technologies. "R-32 would definitely make its appearance in the GCC region," he says. "This is strongly possible, because the Dubai Municipality takes a holistic approach in its choices in approving refrigerants."

What about consultants? Generally speaking, they say they rely on government bodies like the Dubai Municipality's permit approval process while recommending any refrigerant. Kandasamy Anbalagan, Managing Director, Proleed Engineering Consultants says his firm complies with the standards issued by the Dubai Municipality.



Kandasamy Anbalagan



Elaborating on the rather cagey approach he adopts when it comes to recommending refrigerants, Anbalagan says consultants in the region face their own set of challenges. Refrigerants, he says, come under the scanner for phase-outs and bans, if the GWP is beyond a certain point. This happens frequently – every few years, he says, pointing to the scrutiny that R-134A, R-410A and R-22 have been subjected to. "This makes it difficult for consultants, as they cannot anticipate the changes" he says. "For example, R134A, which was once considered a suitable replacement for R22, due to its low ODP, is now being phased out because of its high GWP. R410A, currently widely used, is expected to be replaced by R32, which presents itself as a more environmentally friendly option. As a consultant, decision-making processes for recommendations are heavily influenced by the availability and performance of refrigerants in the market. These changes disrupt planning and necessitate constant adjustments to align with evolving standards."

The consensus is that the transition to sustainable refrigerants in the Middle East requires a multifaceted approach. Low-GWP options, such as R32 and R1234ze are increasingly being considered for their potential to meet energy efficiency and

compliance requirements while reducing environmental risks. However, their adoption is contingent on enhanced regulations, industry collaboration and technological advancements. Developers, consultants and manufacturers must align their objectives to prioritise sustainability alongside energy efficiency. Efforts to improve safety and minimise leakage are crucial to ensure the viability of low-GWP refrigerants. Innovations in equipment design, combined with stricter enforcement of energy efficiency standards, can pave the way for more sustainable cooling solutions. Public awareness and industry-wide education also play a vital role in accelerating the adoption of environmentally friendly practices.

As the Middle East grapples with rising temperatures and increasing urbanisation, the environmental costs of traditional refrigerants can no longer be ignored. The path forward demands a collective effort to rethink refrigerants and prioritise sustainable alternatives. By addressing the challenges head-on and fostering a culture of innovation and collaboration, the GCC region can lead the way in transforming the cooling industry. [ccme](#)

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# HVAC CLIMATE GOALS ARE UNDER PRESSURE

It is vital that we accelerate regulatory refrigerant transitions in the Middle East, says **Nabil Shahin**

**T**HE GCC region, categorised under Article 5 Group 2 in the Kigali Amendment, faces a unique set of challenges in transitioning from hydrofluorocarbons (HFCs) to lower-global warming potential (GWP) alternatives, such as hydrofluoroolefins (HFOs) or natural refrigerants. Amid mounting urgency from global and regional regulators to accelerate the refrigerant transition worldwide, including in the Middle East, this shift is seen as a critical step in combating global warming and addressing climate change challenges. With a different implementation timeline than other regions, this transition has specific concerns, including the use of flammable refrigerants, the training of technicians and the readiness of regulatory bodies. Additionally, the region's high ambient temperatures present a unique challenge, as refrigerants behave differently under such conditions compared to milder climate regions.

Unique challenges of refrigerant transition in the Middle East include...

1. **Regulating and using flammable refrigerants:** Many low-GWP alternatives, such as HFOs and natural refrigerants, are flammable. This raises significant safety concerns, as improper handling or storage could lead to fire hazards. The region's technicians, who often lack the necessary training to work with these refrigerants, require skill upgrades to ensure safe and effective handling. Clear safety protocols and updated regulatory measures are essential to mitigate

these risks. The transition to natural A3 highly flammable refrigerants like R290 (propane) for central ACs and heat pumps, if it ever happens, is a long way off and will involve considerable research to ensure safety.

2. **Technician training and skill development:** Transitioning to these refrigerants demands new skills, including an advanced understanding of flammability, pressure-temperature relationships and system design. To address this, the Refrigerant Driving License (RDL) programme, jointly developed by UNEP and AHRI, is now ready for administering to interested parties. This programme provides comprehensive training materials and testing for technicians before they can claim RDL certification, ensuring they possess the necessary competencies to handle refrigerants safely and effectively. Currently, the availability of trained and certified technicians in the Middle East is insufficient. A large-scale training initiative is needed to bridge this gap.
3. **Regulatory and governmental preparedness:** Building codes, safety standards, transportation, warehousing and other regulations must evolve to accommodate the use of new refrigerants. Governments in the region need to expedite regulatory updates, aligning them with global standards while addressing local needs. This aligns with the global regulatory push to accelerate climate action



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through rapid adoption of lower-GWP refrigerants, underscoring the need for immediate and coordinated efforts. New refrigerants are already entering the Middle Eastern market, making it important for regulatory bodies to begin the process and keep pace with developed countries.

4. **High-ambient temperature conditions:** The Middle East's extreme climate, with temperatures regularly exceeding 40 degrees C, is a challenge. Certain refrigerants may exhibit reduced efficiency and capacity under such conditions. Evaluation of refrigerants to ensure suitability for high-ambient temperatures is essential.
5. **Regulations requiring low-GWP refrigerants:** The Kigali Amendment to the Montreal Protocol necessitates the use of refrigerants with low-GWP ratings. In the United States and Europe, maximum GWP levels of 700 and 750 have been established, with plans to lower this threshold to below 150, soon. One of the dilemmas faced by the Middle East is whether to follow a phased transition, starting at a higher GWP threshold or to leapfrog directly to a low GWP of 150. This approach would avoid the need for successive transitions and align the region with future global standards from the outset. Global pressure to adopt low-GWP





refrigerants is increasing due to its role in reducing greenhouse gas emissions. The AHRI Refrigerant Transition Work Group is actively discussing this strategy, though no decision has been made. As the GCC region falls under Group 2, it has a delayed compliance timeline, providing an opportunity to adopt a tailored solution suitable for local conditions rather than mimicking other regions.

6. PFAS in refrigerants and new regulations: Some refrigerants contain per- and polyfluoroalkyl substances (PFAS), commonly referred to as “forever chemicals”, due to their persistence in the environment. PFAS are increasingly being scrutinised for their potential harm to human health and the environment. The European Union is considering a comprehensive ban as early as 2026. This poses a





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significant challenge for the HVAC industry, as refrigerants containing PFAS could be out of reach due to regulatory changes.

## The role of AHRI MENA's Refrigerant Transition Work Group

Recognising these challenges, AHRI has established a Refrigerant Transition Work Group, comprising regional and international HVAC system and component manufacturers and is chaired by Murad Abu Salimah from Danfoss. The group's primary objectives are:

1. Evaluating refrigerants for regional suitability: The work group is assessing the performance of available refrigerants under high-ambient conditions. Field testing is being considered to determine which refrigerants are most effective in the Middle East's climate. This data-driven approach ensures that selected refrigerants meet efficiency as well as safety requirements.
2. Guiding regulatory bodies: By leveraging lessons from Europe and the United States, the work group aims to help regional regulatory authorities adapt to the refrigerant transition efficiently. This involves providing technical assistance, sharing best practices and avoiding the need to "reinvent the wheel".
3. Collaborating with UNEP and Local National Ozone Offices: The group will work with UNEP to support local ozone offices in developing phasedown plans for HFCs. These plans must align with the Kigali Amendment's mandate to reduce HFC consumption by 85% by 2047. While each country will present its own plan and timeline, creating a successful model in one nation can serve as a blueprint for others in the region.
4. Involving stakeholders and ensuring industry readiness: The group has initiated discussions with chemical companies to evaluate new refrigerant products suitable for the Middle East. The intent is to ensure that HVAC manufacturers

and industry collaborate with regulatory bodies and international organisations to address technical and regulatory barriers. Training programmes and certification schemes for technicians are a critical component of this collaborative effort.

## Phasedown timeline and compliance

Under the Kigali Amendment, Middle Eastern countries are required to develop HFC phasedown plans. These plans outline the steps needed to achieve an 85% reduction in HFC consumption by 2047. Each country – in conjunction with their ozone office – will play a central role in crafting and implementing these timelines, ensuring alignment with global standards while addressing regional priorities. The accelerating global regulatory focus on meeting these targets highlights the need for swift and decisive action in crafting effective phasedown plans as soon as possible. This task of the phasedown, although the GCC region falls under Article 5 Group 2 hottest nations, will commence in 2028 and reduce the level to 15% of 2024-26 levels by the year 2047. Which means that the ozone office of each of these countries must present the plans as soon as possible and decide on how the phase-down will be implemented and what sectors will be affected. The specific reduction steps may include a freeze date in 2028, a 10% reduction by 2032, 20% by 2037, 30% by 2042, and an 85% reduction by 2047. Most likely, this region will start shifting sooner than 2028, as most manufacturers have already switched to the new refrigerants in the developed countries and will most likely not continue to produce two separate products or continue to develop products with harmful refrigerants.

## Importance of refrigerant reclamation

An often-overlooked aspect of refrigerant management is the critical role of reclamation. Approximately

60% of the refrigerants sold globally are used to replenish existing systems due to leaks or servicing needs, while only 40% is used in new equipment. Training and the development of robust reclamation centres in the Middle East could significantly reduce the demand for new refrigerants, lower costs for end-users and mitigate environmental impact. Reclamation ensures that high-GWP refrigerants are captured, refined (removing moisture and oil) and reused, minimising their release into the atmosphere and supporting compliance with phasedown targets.

## The path forward

As the Middle East embarks on this complex refrigerant transition, a multifaceted approach is essential. By focusing on training, regulatory alignment, reclamation infrastructure and targeted refrigerant evaluations, the region can achieve a smooth transition while meeting its obligations under the Kigali Amendment. The global regulatory push for accelerated refrigerant transitions underscores the critical need for the Middle East to align with these initiatives to combat climate change effectively. The collaborative efforts of industry stakeholders, regulatory bodies and international organisations will be crucial in overcoming the challenges and unlocking the opportunities of this transition. The Refrigerant Transition Work Group's initiatives provide a roadmap for success, ensuring the Middle East's HVAC industry is well-prepared for the future.

The work group will also release articles to update stakeholders on various elements of the transition in the upcoming months, keeping the industry informed and engaged. [ccme](#)

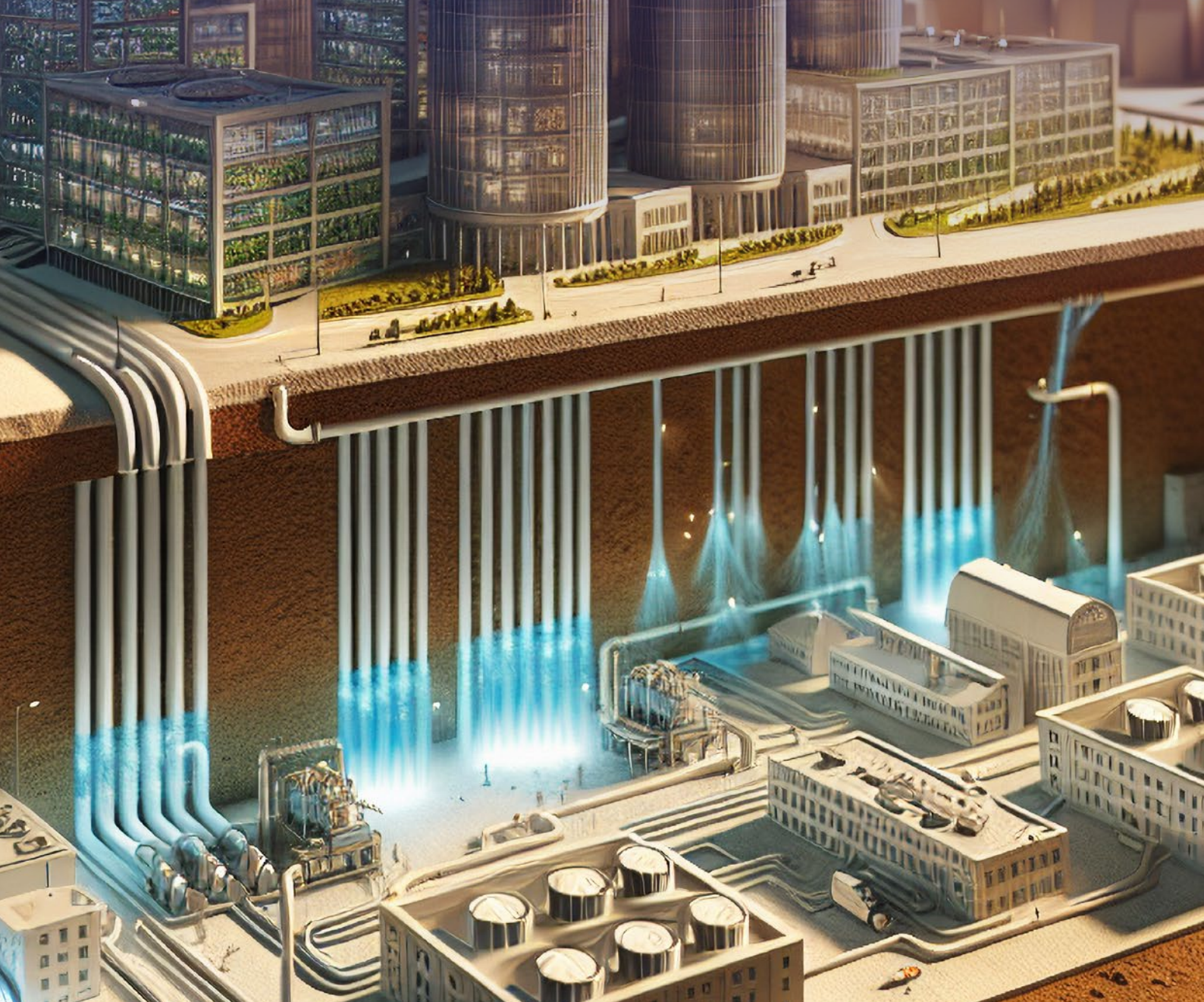
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TRACKING THE DISTRICT COOLING INDUSTRY IN THE MIDDLE EAST



**PERSPECTIVE: DISTRICT COOLING: A VITAL LINK TO SUSTAINABLE URBAN PLANNING**

# DISTRICT COOLING: A VITAL LINK TO SUSTAINABLE URBAN PLANNING

Given that District Cooling offers a more energy-efficient and environmentally friendly solution to the region's growing cooling demands, it is important to persist with continued investment, innovation, and collaboration between public and private sectors to realise its full potential. **Kevin Laidler** of Armstrong Fluid Technology explains how...



**A**S CITIES across the Middle East continue to expand rapidly, the demand for energy-efficient and sustainable infrastructure has never been more critical. From Ras Al-Khaimah to Riyadh, population growth is paving the way for even greater economic prosperity, firmly establishing the region as a global hub for business and innovation.

However, as populations across the Middle East continue to soar, so do its energy demands – and its temperatures. Between 2010 and 2021, energy consumption in the region increased from 4.8 billion to 5.5 billion barrels of oil equivalent (BOE), and demand is expected to hit 7.3 billion BOE by 2035. And, in a region where the summer months regularly register above 40 degrees C and temperatures are rising at twice the global average, the cooling needs of urban environments are placing enormous pressure on energy resources. This creates a complex challenge: How to meet increasing cooling demands while minimising environmental impact. District Cooling is, of course, the answer.

Energy efficiency is just one of the many benefits of District Cooling – these smarter systems are also helping cities and nations across the region to hit their sustainability and development targets.

A key innovation is sector coupling,

which links different energy systems like cooling, electricity and renewable energy to create a more integrated, efficient and resilient urban infrastructure. For example, District Cooling systems can be seamlessly integrated with renewable energy sources, like solar power, allowing cities to reduce their reliance on fossil fuels and significantly lower carbon emissions. By connecting District Cooling with renewable energy sources, such as solar power, cities can reduce reliance on fossil fuels and cut carbon emissions. This approach supports regional sustainability strategies like the UAE's Energy Strategy 2050, which aims to produce 50% of the nation's energy from clean sources, and Dubai's 2040 Smart Urban Master Plan, which seeks to lower building carbon footprints by 30% by 2030.

However, in order to secure sustainable urban development for tomorrow, innovation needs to continue today. And this is where, in my experience, the incorporation of advanced technologies into a District Cooling system are crucial for successful long-term outcomes.

For example, engineered-to-order packaged systems are designed to optimise the efficiency and performance of District Cooling systems. Such customisable systems are pre-

engineered, factory-assembled and tested to ensure seamless integration with District Cooling plants. By offering intelligent pumping and control solutions, District Cooling systems further improve energy efficiency, reduce operational costs and support water conservation efforts, all of which are critical to securing the region's ambitious sustainability goals and safeguarding sustainable urban development.

District Cooling is vital for sustainable urban planning in the Middle East, offering a more energy-efficient and environmentally friendly solution to the region's growing cooling demands. However, to fully realise its potential, continued investment, innovation, and collaboration between public and private sectors are essential. With continued focus on sustainable cooling solutions, such as a District Cooling system, the region's cities can become greener, more energy efficient and better equipped to meet the challenges of a rapidly changing climate. [ccme](#)

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# 'DISTRICT COOLING

can go up to **60%**  
**PENETRATION'**

**Khalid Al Marzooqi**, the CEO of Tabreed, in a free-wheeling interview with Surendar Balakrishnan of *Climate Control Middle East* magazine, speaks on market penetration, the use of geothermal energy, refrigerants and on many more subjects. Excerpts...

**Editor's Note:** This interview was conducted in Q4 2024.

## **WHAT specific measures is Tabreed taking to fully realise the potential of District Cooling in decarbonising our cities?**

In general, District Cooling is a major player in decarbonising our cities, because it gives greater efficiencies compared to regular cooling in a market that depends on cooling. It is a simple method of increasing market penetration of District Cooling, and 1.5 million tons of CO2 emission can be avoided a year. Currently, the market penetration is not more than 13%. If we increase the penetration, we save more. It is more of an indirect result. Yes, District Cooling does consume energy, but if we use renewable energy, we can solve that issue.

We would like 100% penetration. District Cooling can go up to 60% penetration through targeting high-rise buildings, campuses, universities, hospitals, shopping malls, train depots and what you have. The target of 60% is achievable owing to the volume of the buildings available that can be connected or retrofitted to District Cooling. The rest cannot be achievable due to shapes or sizes in terms of technical feasibility.

### **Given that Tabreed is a pioneer of District Cooling in the UAE, could you take us into the specifics of your global efforts in using the Tabreed template in providing cooling to cities around the world?**

In the region, Tabreed has exported its knowledge to Bahrain, and we have Saudi Tabreed and Tabreed Oman. Going beyond the region to Asia, we have partnered with IFC, which has been good for a presence in India. And we are looking to expand in the region. Tabreed Misr is also there and commenced operation in 2023. In addition, we are part of the steering committee for UNEP's Cool Coalition, and are an integral part of the steering committee that is specifically looking at climate change – of how to combat climate change by providing suitable cooling within the boundaries of each country. We were active during COP28 and during the recently concluded

COP29. So, we are sitting in the conversation, as we are recognised as a global leader in combating global heating.

We are investors and operators, as well, of one of the largest District Cooling companies in the world, and having been in the region, we know the challenges. We have an idea when it comes to implementation and construction of projects, and understand the importance of regulatory control, which is critical part of District Cooling companies. We have regulation in Abu Dhabi and in Dubai, and the experience of regulation is proving to be useful across the region.

### **What is the significance of Tabreed applying the heat transfer nanofluid technology across its portfolio of District Cooling plants? Overall, how much have you been able to reduce electrical energy consumption and reduce greenhouse gas emissions?**

Major technical breakthroughs when they come to District Cooling, in particular, do not come that easy. The nanofluid technology is a proof of concept that is running in a plant and is giving 15% efficiency for the same energy.

Now, you have to be very careful with these materials when deploying in major scale, and we are taking a conservative approach to see if we can get the same 15%. That 15% is a seven per cent increment and is a huge gain for us. If you have 1.3 million tons of refrigeration, seven per cent energy efficiency is huge progress – it means an extra seven per cent of carbon emission reduction.

The technology needs a careful deployment, as we have manufacturer warranties, and so we need to make sure we don't damage the units, especially the larger units. We are hopeful that by the end of this summer, we are going to test it on larger units, and we hope to have good results. In a worst-case scenario, it can be reversed in adverse cases involving small chillers, but it did not come to that, and we succeeded.

We are a test bed to test the product of the manufacturer. So, this

summer, with some tweaking of the same material, we deployed in larger units to see its performance. Summer is a more indicative period. In winter, we don't have an issue as the climate is milder and the towers do well. With summer WB temperatures, efficiency of equipment drops down, so to just gain that efficiency is significant.

### **What are the specifics of Tabreed's corporate policy and outlook towards the extensive use of renewable energy to power District Cooling plants?**

Before the time they were called renewable energy, Tabreed had built thermal energy storage. When renewable energy came, later on, thermal energy was used for flexibility of operation. Today, thermal energy storage comprises 20-25% of the capacity of our plants. And when renewable energy came, these thermal energy storage tanks proved to be the best form of storage of energy. A renewable energy source like PV can be easily stored in TES, and what we built as thermal energy storage years ago turned out to be excellent source of peak-shifting mechanism; and at the same time, they act as battery for customers who want to store solar energy.

Moving to geothermal, we can go beyond and tap into the renewable energy source. At the end of the day, we are consumers of energy, and to generate energy from geothermal is a significant move. We were lucky to have tapped into geothermal, and it is producing 700 tonnes of cooling. It is integrated with the existing cooling capacity at Masdar; that way, it is augmenting. Energy is coming from thermal wells, and we are using absorption chillers. So, we are using geothermal hot water in running absorption chillers. We are celebrating the one-year anniversary of geothermal at Masdar.

The potential of this one is that we are eyeballing data centres for this. It caters for their requirements, and it is 100% reliable and offers uninterrupted supply.

The fact that it has to be next



door to the data centre is important to note. Data centres would be our top priority. They want their energy to be renewable. If you tap into solar, you need batteries. If you try to tap into wind, it is not available, so generation depends on Natural Gas, which is a hydrocarbon. So the natural resource that is fully renewable is geothermal energy.

Absorption technology is trouble-free and maintenance-free, though it is more expensive. All said, geothermal is one source of completely uninterrupted renewable energy. Solar needs batteries, and batteries don't last that long and have much shorter life expectancy than geothermal. Geothermal sources in the ground are subterranean reservoirs and are only present in some places, so we have to carry out surveys, and that is why we are conducting surveys with ADNOC to identifying them.

Masdar was a Proof of Concept. It was a real eyeopener for a lot of people in the region. There is a huge movement

towards looking at geothermal wells. It is producing chilled water and is not just ink on paper. We are not about slogans and banners. No, no, we do it. We look at the potential and say to consumers that it is available.

Google and Microsoft are paying a fortune for energy, and that is not sustainable. You just pay for digging the wells, and this thing is just free energy. The resources are huge. The Masdar geothermal well is 7,000 feet deep, so you have to be certain that the energy is there through the survey. And thankfully, we have a partner in ADNOC with the expertise. We have to carefully consider the project due to the huge capital outlay.

Drilling might be expensive, but economy of scale will bring the price down. Look how much solar used to cost, so it is the same thing with geothermal. Also, don't forget that solar has a life expectancy, and it degrades with time. This one does not. All you have to do is to make sure you inject anti-corrosive additives to prevent corrosion.

**What specific measures is Tabreed taking to increase the uptake of treated sewage effluent (TSE) for cooling tower makeup, given that TSE has competing demand from irrigation?**

In one sentence, bring them on – as much TSE as you can get. One of the best uses of TSE will be DCPs. Efficiency comes from cooling towers, but they consume huge quantities of water. The unfortunate fact is that there is not enough TSE to consume. The network of TSE cannot keep up with the volume we need.

They were designed for irrigation; they were not designed for DCPs. Our flagship plants in Downtown Dubai run on TSE that is supplied by DEWA.

The quality of TSE is also very important. It may be available, but could be of low quality that requires lot of polishing. So the supplier should provide within an acceptable level of quality.

All our plants are designed to use TSE. Where quality is low, we mix it with potable water to reach an



acceptable level. TSE will be used but is hindered by the fact that the distribution network cannot keep up. But definitely, most of our plants have TSE and RO to polish them.

**We are fast approaching 2030, seen as a pivotal year in making a decisive shift towards climate-friendly and safe refrigerants? What is your policy in aligning with global refrigeration transition efforts? What steps have you taken in the past one year to mitigate climate change in the context of refrigerants used in your plants?**

People overlook refrigerants. As far as Tabreed is concerned, we phased out all the banned refrigerants, such as R12, years ago. And we have a strict rule on venting of refrigerants. We have refrigerant reclaiming units. Before the maintenance starts, all the refrigerants are sucked out, weighed and reloaded to see how much is lost. We keep a tab on our inventory of refrigerants. Despite the fact that some chillers come at a more competitive price, we look at refrigerants and go with those that are more climate friendly.

While there is all the talk about District Cooling penetration, you have the rest that is completely uncontrolled on top of buildings. So regulation has to be very strict. So you can see how much is not controlled, as District Cooling penetration is low compared to other forms of cooling.

We are in line with the Ministry of Climate Change and Environment. They have set up rules for decarbonisation by 2050. We come under the 'industrial' sector. We are meeting current targets, and we will be able to meet 2050 targets, as well.

We have no control on the generation of electricity, so we are highly dependent on DEWA. We are deploying additional measures, like phase-changing materials, geothermal and more efficient chillers and also solar to achieve 2050 targets, so the Ministry of Climate Change and Environment will be our roadmap to follow.

We are very focused on ESG, and as per our annual ESG report, Scope 1 is the only emissions we have, since we don't generate our energy. Scope 2 has to do with the generation part.

And Scope 3 is about the choice of equipment. Scope 1 and 2, they are combined. You will find the compliance in our latest report, on our Web site.

We are closely audited. We are under the microscope when it comes to regulators, and so we do everything we can to minimise our impact on the environment. We do what we can to live up to that sustainable mantra.

**The Abu Dhabi Department of Energy has in place measures to protect the interests of consumers. Generally speaking, what is Tabreed doing to optimise cost of operating District Cooling plants, so as to be able to pass on greater monetary savings benefits to end-users?**

We are following the regulations of the Department of Energy. The major parts of our schemes are licenced by the DoE, which means we are fully in compliance with the DoE. Be they charges to customers or customer rights, without being in line, we won't be granted licence. Majority of our plants are licenced.

As for passing on of the benefits, this has to do with how energy is produced, and if TSE was available, we would pass on the benefit to the customers. Basically, if any savings are there, they would be passed on to the consumer. Energy in Europe is through multiple sources; here, DEWA or ADDC do the rates.

**Is Tabreed working towards interconnecting District Cooling networks for more optimised use of the chilled water that is produced across its portfolio?**

When it comes to our plants, which are within, we don't have isolated plants. In Saadiyat, both our plants are connected. Our future plant in Raha Beach is also interconnected. Wherever they are connected, we take advantage of hydraulic systems. We don't have much neighbouring networks, except in one place. Wherever there is a possibility, we are ensuring interconnection for the purpose of redundancy. We have places where only one plant exists, but it does have in the design for future expansion, so most of our networks are expandable

and can connect multiple clients. In terms of idle capacity, you cannot call it idle, because the difference is huge in the seasonality of cooling demand. We go down as much as 50% and 100% during summer. Some go to 50%, some even lower. I wish we had idle capacity. Some of the capacity is built in. We do not overbuild. We start to build only when a developer comes in and signs a contract that I need this after 2-3 years. We are careful how we build. We need to know how to deploy your capital. So, instead of idle capacity, it is about seasonality, literally down by 60%. It is a simple approach. If the weather is great, nobody is using air conditioning. So, we are very much in line with weather and energy consumption.

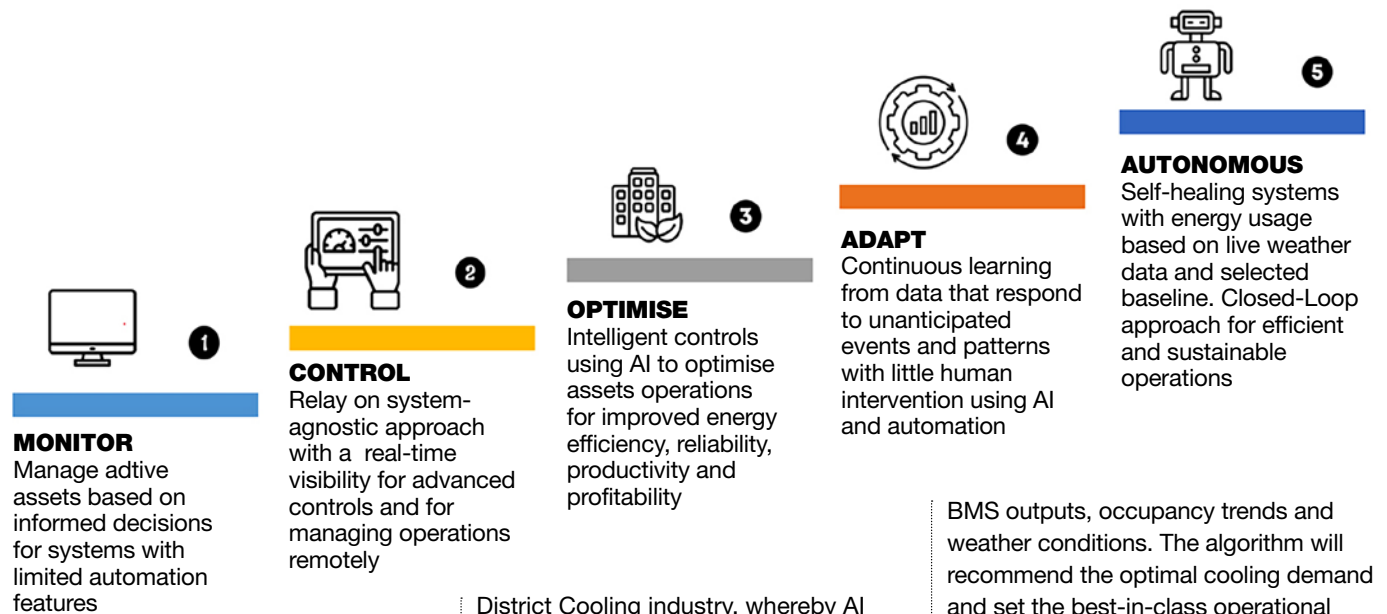
**Given that Tabreed shares a leadership platform with Engie, what specific mechanisms do the two companies have to jointly steer the ship towards expansion of the portfolio of District Cooling plants and greater operational efficiency?**

We rely on Engie. They are one of the leaders in the renewable energy world, so for sure, the knowhow and experience trickle down to Tabreed, driving our efficiency number higher. The use of phase-change materials and geothermal and the close look at O&M procedures drove our efficiency up. It also went up due to the shift to VFDs – we saw huge savings. And the fact that we have centralised our operations is a big milestone. We have moved from manned to unmanned. We run 40 plants with one single operator. We are now 91 plants, and centralised operation is a complete change in paradigm. All plants remotely run in Saadiyat. So you can see, all the knowhow has trickled down from Engie. And as I mentioned earlier, they are very big in renewables, so we have the right partner. In October 2023, I visited the Engie plant in Singapore. What they are doing there is remarkable. Eventually, we will get that expertise filtered down to here. [ccme](#)

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# THE TIME FOR AUTONOMOUS BUILDINGS IS HERE

Salah Nezar speaks on the vision for the New Murabba to bring a game-changer solution for the District Cooling industry using AI and ML to achieve unprecedented efficiencies.



**A T NEW MURABBA**, we set new benchmarks by introducing the latest methods and technologies into District Cooling systems, leaving behind conventional practices. Legacy chillers' configurations shall be replaced and automation of controls through AI shall be introduced, as well as optimised sequences of operations.

Our goal is to ensure a complete integration of AI algorithms within the Automation Control Framework and to set new benchmarks. The performance readjustment of various active assets will be done on a continuous basis, enabled through real-time data management and deep understanding of interdependencies of the same.

This marks the beginning of a huge digital transformation in the

District Cooling industry, whereby AI algorithms and predictive models take over tasks hitherto being performed by human beings, such as data analysis, predictive maintenance and making setpoint adjustments in real-time. These systems will continuously learn and keep improving with volumes of data emanating from a multitude of IoT sources and, hence, facilitate never-before-achieved optimisation.

### Key features of the AI-driven system

It all starts with seamless, secure connectivity across all assets to enable frictionless data flow from all IoT devices to the data lake. The raw data gets cleaned, sorted and analysed. AI algorithms will probe this curated data, extracting actionable insights from various sources, particularly historical

BMS outputs, occupancy trends and weather conditions. The algorithm will recommend the optimal cooling demand and set the best-in-class operational parameters.

The subsequent layer of the application lies in suggestions for improvements due to the aggregation of data from various sources, redefining how these sequences of operation are defined based on what really matters to operators. It uses AI models to predict system degradation, asset failures and deviation from the design intent to improve overall plant performance. Real-time setpoint management allows the operators to take necessary actions upfront, thus really allowing for the possibility of remote resolution through centralised control.

### Looking ahead to autonomous District Cooling systems

At the New Murabba, we believe the District Cooling industry has now

entered the new era of efficacy, where AI and advanced analytics self-manage, adjust and optimise systems in real time. Be it predictive maintenance, AI-driven energy optimisation or weather forecasting by predicting their behaviour and adapting to peaks and troughs, these systems are incessantly upscaling

energy efficiency, therefore very much going towards autonomous plants.

**Key trends powering AI adoption**

A few factors have accelerated the pace of integrating AI into District Cooling operations, beyond imagination. These factors are:

- The availability and economy of IoT sensors: Reflecting real-time data on systems' performance and environmental conditions, allowing decisions commensurate with accuracy and timing.
- Advances in cloud computing:



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The company is a multidisciplinary consulting firm and has a track record and specialization in Buildings, Industrial Works and District Cooling and Power Generation Plants.



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The scalability of cloud platforms allows enormous data storage and processing power with remote monitoring, thereby enhancing the functionalities of AI-driven systems.

- Relatively low computing power and inexpensive deployment costs make possible the implementation of expensive advanced AI and ML algorithms.
- Open automation technologies make system integrations and control strategies less problematic, hence making AI more accessible.
- Generative AI: It will enable advanced system optimisation by learning the patterns within operational data.
- Seamless integration: AI-driven insights in every step of the cooling process – design, construction, operation and maintenance – lead to faster preventive and predictive reactions.

## Challenges and strategic solutions

With some key benefits, some challenges must be overcome to realise the fullest potential of high-performance operations. Some major concerns include Low Delta T Syndrome, idle capacity and heat recovery opportunities. How AI and other technologies can help in the given scenarios are as follows:

- **Low Delta T Syndrome:** As is reasonably well known, this is the condition when there is a lack of appropriate temperature difference between the chilled water supply and return lines due to inefficiency. This inefficiency forces chillers, pumps and cooling towers to work harder, consuming more energy and increasing operational costs. Addressing this critical issue requires a best-in-class design practice to ensure the following:
- Correct sizing of cooling components, such as

chillers, plate and frame heat exchangers, pipes, decouplers and valves, to optimise the cooling plant performance.

- **Variable primary flow mechanism:** This mechanism will ensure the dynamic variation in the chilled water stream to maintain the best setpoint temperature.
- **Leveraging advanced controls and IoT sensors with AI-driven algorithms to monitor and adjust operational control points in real-time is a feature.** PICVs on coils allow for pressure-independent control to achieve exact water flow, with minimal wastage, further optimising energy efficiency.
- **Idle Capacity:** The system, if producing more chilled water than is used, can be accurately predicted by employing the power of AI, using historical data on weather patterns and occupancy. Thermal Energy Storage (TES) systems can play an important role in mitigating this issue by allowing surplus chilled water to be stored during low-demand periods and be used during peak times, to be able to balance production with actual demand.
- **Integration of cooling for data centres:** Data centres need to be integrated with the District Cooling loop, requiring low grades of chilled water. This will enable data centres to make use of the return chilled water line, enhance the system efficiency and reduce the cost of cooling.
- **Use of Treated Sewage Effluent:** The use of treated sewage effluent for cooling applications will reduce dependence on freshwater, mainly in cities like Riyadh. On-site STPs will treat the water, which will be a sustainable and economically viable source of water.
- **Waste Heat Recovery:** The employment of heat recovery systems traps this waste heat and reduces the heat rejection

loads on the cooling towers.

That could be utilised to preheat domestic hot water or for heating swimming pools.

Booster heat pumps may be used to maximise the amount of recovered heat while keeping the water at a safe temperature.

- **Renewable Energy Integration:** Integrating PV and thermal solar panels, coupled with heat recovery system, will allow the improvement of efficiencies and reduce dependence on conventional sources of power, which enhances the project's sustainability.

## Delivering optimum efficiency and sustainability

Success will come from how far AI-driven technologies are brought in and how well operators manage the performance at cooling plants. With predictive models, real-time data and renewable energy sources, operators will be able to bring down costs, enhance system performance, and alleviate the financial loads associated with developers and end users.

## Conclusion

The future of District Cooling will be shaped only by AI-powered autonomous systems that adapt and improve continuously with real-time data and predictive analytics. In this regard, for fast-tracking at every level, industry, researchers and policy framers need to join hands and ensure this happens with due regard to data privacy concerns, reskilling of human resources and the formulation of new standards for infrastructure driven by AI. Finally, with strategic partnerships and further innovations, AI-enabled cooling systems will be found in the heart of sustainable, energy-efficient infrastructure in the years to come. [ccme](#)

*The writer is Senior Director, Design Management, MEP at New Murabba. He may be contacted at [snezar@newmurabba.com](mailto:snezar@newmurabba.com)*

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# WHY IT'S ABSOLUTELY CRUCIAL TO GET THE REFRIGERANT CHARGE RIGHT

Excess refrigerant can lead to refrigerant migration, oil dilution and component damage, while insufficient refrigerant can cause inadequate lubrication for the compressor, leading to wear and tear, says **Dan Mizesko...**



*Dan Mizesko is President, Dalkia US Chillers, USA. He may be contacted at [dan.mizesko@dalkiasolutions.com](mailto:dan.mizesko@dalkiasolutions.com)*

**CENTRIFUGAL** chillers are a key component in large chilled water plants and District Cooling plants. These chillers are designed to provide cooling to buildings, factories and other facilities, and they operate by removing heat from the chilled water loop. One of the most critical factors in ensuring that a centrifugal chiller operates efficiently is maintaining the correct refrigerant charge. Proper refrigerant charge is essential for optimal chiller performance and energy efficiency. This article explores the reasons why refrigerant charge plays such a crucial role in the energy efficiency of centrifugal chillers.

## 1. Optimal heat exchange and cooling performance

Centrifugal chillers rely on a closed-loop refrigeration cycle, where the refrigerant is used to absorb heat from the return chilled water loop to be cooled, and release it to the condenser water loop. The refrigerant charge affects the efficiency of this heat exchange process. As I have highlighted time and again, a chiller's efficiency is affected most by its resistance to heat transfer. Too little refrigerant results in inadequate heat absorption, meaning the chiller will have to work harder and longer to achieve the desired cooling effect. Conversely, too

much refrigerant can cause flooding in the evaporator or refrigerant carryover to the compressor, which also reduces system performance and can damage the compressor.

With the correct refrigerant charge, the heat transfer process is optimised. The evaporator absorbs as much heat as possible, and the compressor operates efficiently, leading to better overall cooling performance. This directly impacts the chiller's ability to maintain the desired temperature without over-exerting the system or wasting energy.

## 2. Energy efficiency and operating costs

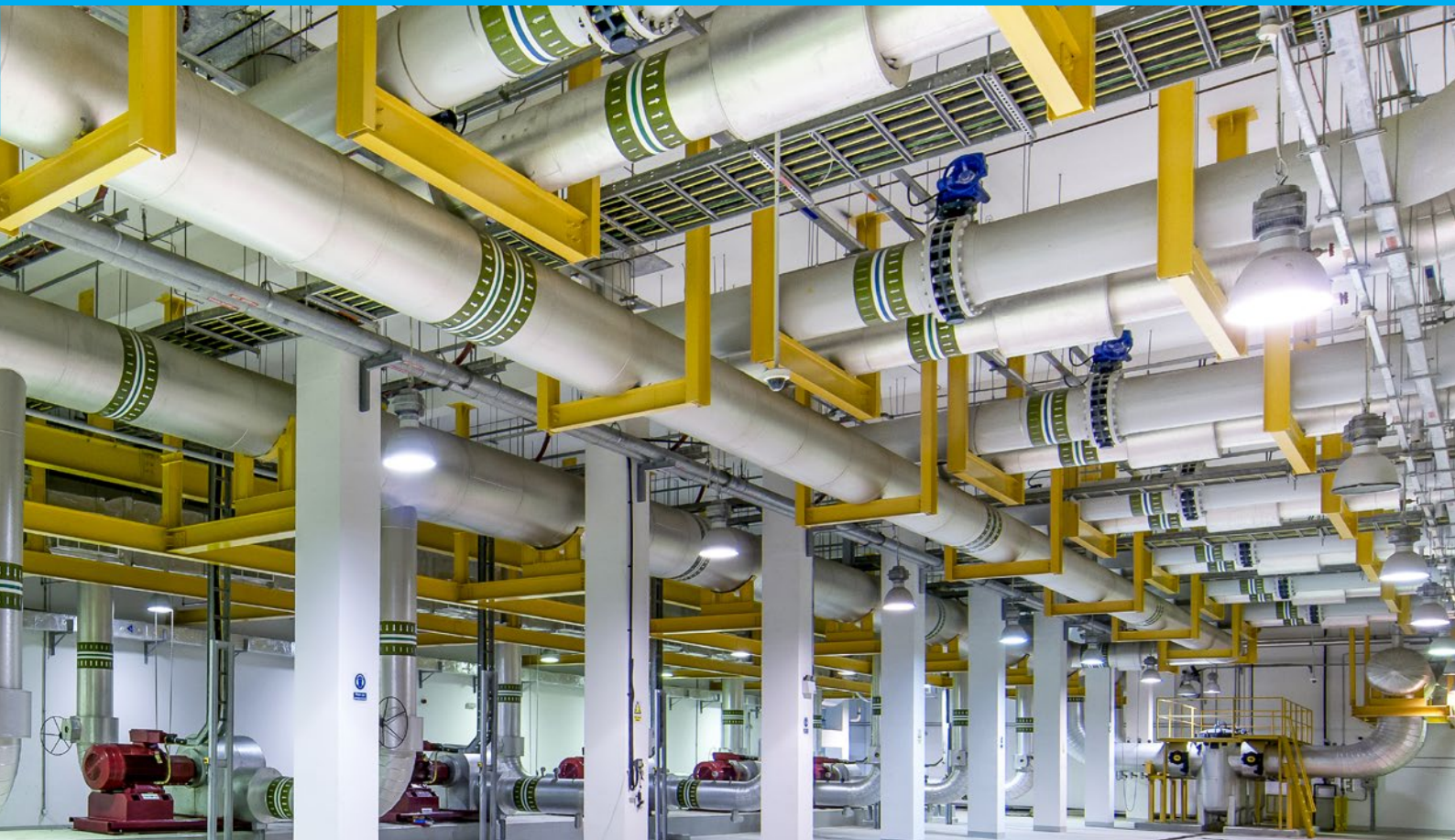
Energy consumption is a significant consideration in operating centrifugal chillers, particularly for large systems that run continuously. A chiller with an improper refrigerant charge will have to compensate for suboptimal performance, often by drawing more power to maintain cooling. If the refrigerant charge is too low, the compressor will run longer to try to maintain cooling, leading to higher energy consumption. On the other hand, an overcharged system may result in excessive pressures, which puts additional strain on the compressor, also leading to higher energy consumption.

By ensuring that the refrigerant charge is just right, the chiller can operate at its most energy-efficient point, which translates into lower electricity bills and reduced operating costs. Energy-efficient chillers are not only more cost-effective but also have a smaller environmental impact, as they consume less electricity and, thus, produce fewer carbon emissions.

## 3. Avoiding overloading of the compressor

The compressor in a centrifugal chiller is responsible for circulating the refrigerant through the system. An improper refrigerant charge can cause the compressor to work harder than necessary. When the refrigerant charge is too high, the compressor may experience higher discharge pressures, which lead to excessive energy use, premature wear and potential mechanical failure. An overcharged system puts extra strain on all components of the refrigeration system, reducing its lifespan.

Conversely, if the refrigerant charge is too low, the compressor may not be able to provide sufficient cooling capacity, which can cause the system to overload, forcing the compressor to



operate inefficiently, again leading to higher energy consumption and potential damage over time.

#### **4. Enhanced system longevity and reliability**

Maintaining the correct refrigerant charge also improves the reliability and longevity of the centrifugal chiller. Systems that are consistently overcharged or undercharged are more prone to breakdowns and require more frequent repairs. Excess refrigerant can lead to refrigerant migration, oil dilution and component damage, while insufficient refrigerant can cause inadequate lubrication for the compressor, leading to wear and tear.

By ensuring the chiller operates with the correct refrigerant charge, businesses can extend the life of their equipment, reducing the need for expensive repairs and downtime and, ultimately, lowering the total cost of ownership over the life of the chiller.

#### **5. Avoiding refrigerant waste and environmental concerns**

Improper refrigerant charging can also contribute to refrigerant loss, which is not only costly but also harmful to the environment. Refrigerants are regulated substances due to their potential to

contribute to global warming and ozone depletion. An overcharged or undercharged chiller may leak refrigerant or require more frequent recharges, resulting in unnecessary waste.

On the other hand, a well-maintained chiller system with the proper refrigerant charge operates more efficiently, preventing unnecessary refrigerant loss and contributing to a greener, more sustainable operation. Minimising refrigerant waste is both an economic and environmental advantage, as it lowers the carbon footprint of the plant.

#### **6. Achieving manufacturer's performance specifications**

Chiller manufacturers provide specific guidelines for the refrigerant charge necessary to meet the system's design specifications. Following these recommendations ensures that the chiller operates within the expected parameters, allowing the system to achieve its designed cooling capacity and efficiency. Deviating from the specified refrigerant charge will lead to performance issues.

By adhering to the manufacturer's specified refrigerant charge, facility and plant managers and owners can ensure that their centrifugal chillers perform optimally, reducing the risk of

system failure, ensuring compliance with regulations, and maintaining the performance guarantees provided by the manufacturer.

#### **Conclusion**

The refrigerant charge is a fundamental factor in ensuring that centrifugal chillers operate with maximum energy efficiency. From enhancing heat exchange efficiency to reducing compressor strain and minimising refrigerant waste, the proper charge is integral to the overall performance, cost-effectiveness and sustainability of the chiller system. Whether for reducing energy consumption, extending the life of equipment or minimising environmental impact, maintaining the correct refrigerant charge is essential for maximising the performance and efficiency of centrifugal chillers. By ensuring that the refrigerant charge is properly monitored and maintained, chilled water plants can achieve significant energy savings, lower operating costs and promote environmentally friendly practices. [ccme](#)

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# UAE reinforces commitment to global energy transition at 15th IRENA Assembly

Her Excellency Dr Amna bint Abdullah Al Dahak emphasises collaboration and strategic partnerships to achieve global renewable energy goals

By CCME Content Team

**H**.E. Dr Amna bint Abdullah Al Dahak, UAE Minister of Climate Change and Environment, participated in the 15th IRENA assembly, where she emphasised the UAE's commitment to accelerating the global energy transition through collaboration, inclusivity and strategic partnerships, the Ministry of Climate Change and Environment (MoCCaE) said through a Press Release.

In delivering the host country's statement, H.E. Dr. Al Dahak highlighted the UAE's commitment to doubling its clean and renewable energy capacity, a key step towards achieving its Net Zero by 2050 Strategy, MoCCaE said. Her Excellency reiterated the ambitious goals of the UAE Consensus, forged at COP28, which calls for tripling renewable energy capacity and doubling energy efficiency by 2030, MoCCaE added.

In the Assembly's Press Conference, Her Excellency



*H.E. Dr Amna bint Abdullah Al Dahak*

underscored the urgency of bridging the gap in renewable energy deployment. She showcased initiatives like ALTERRA, the world's largest private climate investment fund, and the Africa Green Investment Initiative, aimed at driving clean power projects across Africa, MoCCaE said.

According to MoCCaE, Her Excellency advocated for a collaborative and inclusive approach to the global energy transition, urging nations to set ambitious renewable energy targets and create attractive environments for private investment. Her Excellency also highlighted the role of IRENA's platform in measuring

progress and informing strategic decisions as the world prepares for COP30 in Belém, MoCCaE added.

MoCCaE said that beyond the formal Assembly session, Her Excellency engaged in a dynamic IRENA Youth Fireside Chat, where she stressed the important role of youth in climate solutions. Her Excellency encouraged the attending youth to embrace opportunities in the renewable energy sector, emphasising their unique perspectives and leadership potential.

MoCCaE said the UAE, through its proactive diplomacy and renewable energy investments, is committed to driving the global energy transition forward. The country's continued focus on innovation, strategic partnerships and impactful solutions, MoCCaE said, underscores its dedication to building a sustainable future for all, in line with the ambitious goals set forth in the UAE Consensus.





## Leminar partners with enVerid to bring IAQ solutions to the UAE

Company says collaboration focuses on delivering energy-efficient and sustainable HVAC solutions for the UAE market

By CCME Content Team

**L**EMINAR Global said it is partnering with enVerid Systems, a manufacturer of Indoor Air Quality (IAQ) and energy efficiency technologies. Making the announcement through a Press Release, Leminar said it will distribute enVerid's Sorbent Ventilation Technology (SVT) and HVAC Load Reduction (HLR) fan filter boxes in the UAE's plan and spec market.

Leminar said that under the agreement, enVerid will supply sorbent filters and HLR modules manufactured in the United States, supporting Leminar's

mission to provide cutting-edge solutions that meet global sustainability standards. The partnership, Leminar said, reinforces its commitment to delivering energy-efficient and sustainable air conditioning and ventilation technologies tailored to the UAE market.

Christian Weeks, CEO, enVerid Systems, said: "We are excited to partner with Leminar to bring Sorbent Ventilation Technology to the United Arab Emirates. After evaluating the market, we are confident in the significant opportunity for our

technology and in Leminar as the right partner to introduce it to consultants and contractors. We look forward to a successful collaboration in the years to come."

Leminar said enVerid's SVT reduces HVAC system costs, carbon emissions and energy use by filtering harmful gaseous contaminants from indoor air. The approach, Leminar said, minimises the need for outside air ventilation, a traditionally energy-intensive process, while maintaining compliance with ASHRAE Standard 62.1 and the International Mechanical Code.

Leminar said over 1,000 systems equipped with SVT have been installed worldwide in commercial, academic and government buildings. Leminar said the technology also supports LEED and WELL certifications, making it an ideal choice for sustainable building projects.

## Dalkia partners with Sheikh Suroor Projects Department to implement sustainability solutions

Company says the agreement supports the UAE's Net Zero 2050 strategy and involves upgrading cooling infrastructure in Abu Dhabi Mall and Trade Center

By CCME Content Team

**D**ALKIA (EDF Group) said it has signed an agreement with the Sheikh Suroor Projects Department to replace the existing cooling infrastructure in Abu Dhabi Mall and Trade Center. Making the announcement through a Press Release, Dalkia said the agreement aligns with its vision to build a carbon-free energy future, in line with the UAE's Net Zero 2050 strategy. The company said it will execute several sustainability retrofitting activities across the mixed-use complex, including a major shopping mall, offices, apartments and a hotel in Abu Dhabi.

Dalkia said its scope of work includes replacing the cooling plant's dry coolers using the latest technologies to optimise equipment performance and space utilisation around the Trade Center. The company added it would also provide high-standard services through its chiller operation and maintenance business unit.

His Highness Sheikh Suroor and his team – Dr Mohammed Omar Balfaqeeh, General Manager; and Bahaa Ghorab, Projects Director – attended the signing ceremony held at the Sheikh Suroor Projects department, in Abu Dhabi alongside key officials from Dalkia, including Sylvie Jéhanno, Chairwoman and CEO, Dalkia EDF Group; Yannick Duport, Senior Executive Vice President, Sales & Marketing – International Director, Dalkia EDF Group; and Steve Lemoine, CEO, Dalkia Middle East.

H.H. Sheikh Suroor said: "This is just the beginning. We are looking for a long-term partnership to pursue more sustainable and green energy solutions. Moving forward, our next focus is to study and find solutions for other projects in Abu Dhabi."

Jéhanno said: "We are honoured to sign this agreement with H.H. Sheikh Suroor to provide solutions that enable

a sustainable environment for residents, office employees, and visitors of the Abu Dhabi Mall and Trade Center. This is a stepping stone in our strategy to support the energy transition in the United Arab Emirates."

Dalkia said the project promotes sustainable development by offering a more efficient air conditioning solution, enhancing overall wellbeing. Once commissioned, the company will operate and maintain the cooling equipment.



# GCC region energy companies urged to adopt product-level decarbonisation strategies

Lower carbon intensity of GCC region products presents a unique opportunity in regulated global markets

By CCME Content Team

**G**CC region energy companies must transition from broad corporate emissions targets to product-level decarbonisation strategies to stay competitive in increasingly carbon-conscious global markets. Making the announcement through a press release, the World Future Energy Summit, and Strategy& Middle East (ME), part of the PwC network, said the shift is critical to meet evolving regulatory requirements such as the EU's Carbon Border Adjustment Mechanism (CBAM).

The World Future Energy Summit (WFES) and Strategy& ME said the report, titled 'Rethinking Corporate Decarbonization: From Enterprise Targets to Product Strategies', highlights how GCC region energy companies can leverage their relatively lower-carbon-intense products to gain a competitive edge. It calls for redefining emissions measurement, reporting, and mitigation efforts to align with global standards and expectations.

Major energy players in the GCC region are now obligated to report their overall carbon emissions, as part of national biennial carbon inventory submissions, under UNFCCC guidelines,

WFES and Strategy& ME said. However, national and regional carbon policies are evolving, and energy products often fall under the scrutiny of policies developed far beyond their country of production, WFES and Strategy& ME added.

James Thomas, Partner, Strategy&, said: "This marks a pivotal moment for energy players. Setting broad corporate emissions targets is no longer sufficient. By adopting product-level decarbonization, GCC energy companies can transform regulatory pressures into growth opportunities, securing their position as leaders in the global energy transition."

The report presents a 3D framework which represents a real-time view of the latest global policies impacting sectors and products, WFES and Strategy& ME said. It enables GCC region energy companies to align carbon accounting and emissions mitigation efforts with regulatory demands and market expectations, WFES and Strategy& ME said. The approach helps companies respond dynamically to policy shifts and stakeholder demands, positioning them ahead of competitors who adhere to traditional enterprise-level emissions goals, WFES and Strategy& ME added.

Leen Al Sebai, General Manager, RX Middle East and Head of the World Future Energy Summit, said: "GCC energy companies have a unique opportunity to lead by example, leveraging innovative decarbonization strategies to align with global demands. This transition will not only safeguard market access but also position them as pioneers in the low-carbon economy,"

Shifting to product-level carbon accounting offers GCC region energy players several strategic advantages, such as enabling tailored emissions reductions to meet market standards,

improving compliance with global policies and enhancing product transparency to build customer trust and reputation, WFES and Strategy& ME said. Additionally, they said, it establishes flexibility for adapting to shifting policies and market dynamics, ensuring long-term resilience.

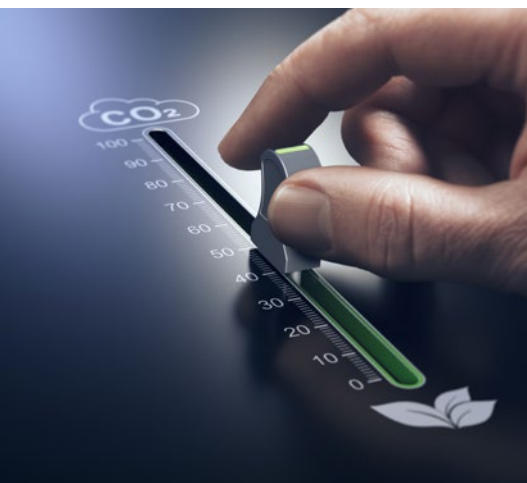
WFES and Strategy& ME said the report notes that implementing a product-level carbon accounting strategy is not without its challenges, however. Many GCC region energy players have yet to fully codify and deploy carbon accounting policies at the corporate level, let alone for individual products.

Several GCC region countries are still developing their regulatory and legislative agenda for carbon emissions. Additionally, robust methodologies and significant data management are needed to accurately allocate emissions from shared facilities, particularly in complex operations, WFES and Strategy& ME said.

The report, the two organisations said, outlines four key actions for GCC region energy players:

- Develop, codify and deploy robust product-level carbon accounting frameworks that align with global regulations.
- Invest in advanced automation and data management systems for accurate emissions reporting and real-time policy compliance.
- Focus decarbonisation efforts on products exported to high-regulation markets, ensuring compliance and competitive advantage.
- Invest in capabilities to continuously track and respond to shifting carbon policies globally, ensuring adaptability and leadership.

WFES and Strategy& ME said the GCC region continues to take the lead through positioning itself as a global energy leader. Transitioning to product-level decarbonisation represents a pivotal opportunity to lead by example. WFES and Strategy& ME said by taking these steps now, GCC region energy companies will be well-positioned to navigate future changes, fostering resilience and growth in a carbon-conscious world.



# Bry-Air commemorates 60 years of operations

Celebrates milestone with Dubai event

By CCME Content Team

**B**RY-AIR, part of the Pahwa Group, celebrated what it described as six decades of innovation and excellence by gathering stakeholders for an event at Mövenpick Grand Al Bustan Hotel & Convention Centre Dubai.

Bry-Air, which offers dehumidification, gas phase filtration, mould remediation and waste heat recovery solutions, and holds related patents, spoke on incorporating patented Green DryPurge (GDP) technology for low-dewpoint dehumidifier requirements. The company also highlighted its gas phase

filtration systems for molecular filtration of airborne particles and gaseous contaminants.

During the event, Bry-Air also highlighted its adsorption chillers, which it said, use low-grade waste heat for cooling requirements.

In the course of the evening, the discussion moved to Pahwa Group's other organisation, Desiccant Rotors International (DRI), which the Group described as providing fresh air treatment, evaporative cooling, green buildings-related and dehumidification solutions.

The event was an opportunity to focus on DRI's customised air-handling units (AHUs) and on its evaporative cooling products for educational institutions, factories and cinema halls, among other facilities.

The occasion was also an opportunity to discuss Pahwa Group's other enterprise, Delair India, which the Group said manufactures refrigeration dryers, desiccant dryers, gas dryers, air receivers, after coolers, moisture separators, air filters and auto-drain valves.



Varun Pahwa, President - DRI, Pahwa Group (standing, second from right) and the team



# Eurovent's guide to residential ventilation incentives highlights support for sustainable renovations

HVACR industry body underscores the importance of ventilation systems in ensuring energy efficiency and occupant wellbeing

By CCME Content Team

**E**UROVENT announced the release of its guide to European financial incentives for the installation of mechanical ventilation systems in residential renovations. Making the announcement through a Press Release, Eurovent said the guide provides detailed insights into support schemes introduced by various European member states, many of which are co-financed by the European Union.

Eurovent said the new publication offers a country-by-country breakdown of available incentives, focusing on the integration of mechanical

ventilation systems during renovations of single-family homes and apartment buildings. Eurovent emphasised that the systems are critical for improving Indoor Air Quality (IAQ) in increasingly airtight buildings, reducing energy consumption, and enhancing occupant health and wellbeing.

Stijn Renneboog, Deputy Secretary General, Eurovent, said: "It is important that financial incentives for residential renovations support ventilation improvements, as well. Mechanical ventilation systems help lower heating bills and improve Indoor Air Quality, which is especially important, as

improvements to the building envelope make the building more airtight. Without controlled ventilation, this could have dire consequences for the health and wellbeing of occupants and the integrity of the building. This is why we promulgate the slogan: 'no renovation without ventilation'."

Eurovent added that while renovations deliver numerous benefits, they often involve significant upfront costs. Financial support for ventilation improvements is essential to making renovations more accessible, reducing carbon emissions and promoting healthier indoor environments.

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# CAREL to host webinar on EPBD and ESPR regulations

Online event will explore new EU regulations aimed at improving energy efficiency in buildings

By CCME Content Team

**C**AREL said it will be hosting an interactive webinar, titled “New efficiency policies for products and buildings in the EU” on February 20 from 10am to 11am, CET. Making the announcement through a Press Release, CAREL said the event will provide insights into the revised European EPBD (Energy Performance of Buildings Directive) and the ESPR (Eco-design for Sustainable Products Regulation).

CAREL said Raul Simonetti, HVAC/R Corporate Business Manager, CAREL, and Miriam Solana Ciprés, HVAC/R Technical Knowledge Manager, CAREL, will conduct the webinar. It will be in English, the company added.

CAREL said the session will cover the key aspects of EPBD (EU) 2024/1275 and ESPR (EU) 2024/1781, which came into effect on May 28, 2024 and July 18, 2024, respectively. According to CAREL,

the revised EPBD (Energy Performance of Buildings Directive) focuses on improving energy efficiency in buildings, promoting zero-emission construction, and adopting smart technologies to monitor and reduce energy consumption. Meanwhile, ESPR (Eco-design for Sustainable Products Regulations) broadens the scope of eco-design to include life cycle analysis and sustainability criteria, aimed at reducing environmental impact, improving efficiency and lowering carbon footprints in buildings.

The company said the webinar would combine an informative lecture with a fun quiz, offering prizes to participants who answer correctly and quickly. It added that the event is free to attend, and participants can register through the following link:

[https://carel.zoom.us/webinar/register/8217363350450/WN\\_Gb-pxX8AR8-hipWMV1my6w](https://carel.zoom.us/webinar/register/8217363350450/WN_Gb-pxX8AR8-hipWMV1my6w)



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# {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.

“One of the standout segments of 2023 involved chillers with a capacity above 50 kW, which experienced remarkable double-digit growth, reaching a market value of €1,997.7 million. It must be noted that air-cooled and water-cooled chillers fuelled the expansion. While the long-term analysis by cooling and heating type revealed differing trends, the refrigerant analysis concluded that the phase-down of HFCs in 2023 was rather slow, despite a decline in the use of R-410A.”

p08

“The coverage would include attempting to understand prevailing mindsets and barriers to the transition; the scope and extent of intervention; the regulatory landscape to facilitate the transition; the need for nuance to protect the interests of manufacturers, building owners and other stakeholders; the need for surveillance for protecting fair trade and for safeguarding the health and wellbeing of end-users and technicians; and the need for monitoring progress.”

p10

“Air conditioning was a most important invention for us, perhaps one of the signal inventions of history. It changed the nature of civilisation by making development possible in the tropics. Without air conditioning, you can work only in the cool early-morning hours or at dusk.” He went on to say: “The first thing I did upon becoming prime minister was to install air conditioners in buildings where the civil service worked. This was key to public efficiency.”

p12

Speaking on Variable Refrigerant Flow (VRF) systems, Chakkingal says he has seen advancements vis-à-vis refrigerants. While R-410A was previously used due to its non-flammable nature, it had a high GWP, he says. “The replacement for that is R-32, which is slightly flammable,” he adds. Manufacturers, particularly in Japan, he says, have implemented smart sensors in their motors to detect refrigerant leaks and reduce risk factors. Adopting this approach, he says, Sobha’s focus is on avoiding all avenues of leakage by utilising robust controls and advanced technologies.

p15

Transitioning to these refrigerants demands new skills, including an advanced understanding of flammability, pressure-temperature relationships and system design. To address this, the Refrigerant Driving License (RDL) programme, jointly developed by UNEP and AHRI, is now ready for administering to interested parties. This programme provides comprehensive training materials and testing for technicians before they can claim RDL certification, ensuring they possess the necessary competencies to handle refrigerants safely and effectively.

p16

“By offering intelligent pumping and control solutions, District Cooling systems further improve energy efficiency, reduce operational costs and support water conservation efforts, all of which are critical to securing the region’s ambitious sustainability goals and safeguarding sustainable urban development.”

p20

## SALES CONSULTANT - UAE

### Revenue Targets:

- Support the Sales team to achieve Sales Quotas: Meet or exceed monthly, quarterly, and annual sales targets.
- Increase Market Share: Expand the company's presence and brand visibility within the GCC region markets by acquiring new sales partners and retaining existing ones.

### Customer Engagement:

- Client Acquisition: Identify and secure new business opportunities.
- Customer Retention: Maintain strong relationships with existing clients to ensure repeat business and customer loyalty.

## SALES ENGINEER

### Key Responsibilities:

- Develop and maintain relationships with distributors, clients, contractors, and key stakeholders in the UAE.
- Promote and sell our range of HVAC products, including fans motors, and related equipment.
- Lead generation through active networking and introduction to new customers.
- Manage and collaborate closely with the team of application engineers to achieve sales targets.
- Provide technical expertise and support to clients
- Keep up-to-date with industry trends and competitor products to stay ahead in the market.

### Requirements:

- Bachelor's degree in Mechanical Engineering
- 5-7 years of experience in sales engineering within the HVAC industry within the UAE., with Work history: HVAC (with direct or indirect contact with fans motors).

## ASSISTANT - SALES MANAGER (QATAR)

### Key Responsibilities:

- Develop and maintain relationships with distributors, clients, contractors, and key stakeholders in the Qatar
- Promote and sell our range of HVAC products, including Chillers, VRF, AHUs, Rooftop Units, Splits, and related equipment.
- Lead generation through active networking and introduction to new customers.
- Manage and collaborate closely with the team of application engineers to achieve sales targets.
- Provide technical expertise and support to clients
- Keep up-to-date with industry trends and competitor products to stay ahead in the market

### Requirements:

- Bachelor's degree in Mechanical Engineering
- 5-7 years of experience in sales engineering within the HVAC industry within the Qatar.
- Fluent in English.
- Sales and networking skills
- Strong knowledge of HVAC equipment, including Chillers, VRF, AHUs, Rooftop Units, Splits, etc. ( compulsory )
- Excellent communication and interpersonal skills.
- Proven track record of meeting or exceeding sales targets.
- Preferable connections with key stakeholders in the Qatar's market

# NOW HIRING

## MARKETING SPECIALIST

### Key Responsibilities:

- Develop and execute marketing strategies aligned with company objectives.
- Plan, manage, and oversee exhibitions, corporate events, and partner activation activities.
- Serve as a communication bridge between partners and internal teams.
- Provide training and mentorship to the current marketing teams
- Design and implement impactful campaigns to enhance brand presence and customer engagement.
- Collaborate with cross-functional teams to ensure marketing alignment with sales goals.
- Manage relationships with external agencies, creative teams, and third-party vendors to ensure high-quality and timely execution of projects.
- Negotiate contracts, budgets, and deliverables with third parties to optimize marketing ROI.
- Monitor market trends and competitor activities to identify opportunities for growth.

## SALES ENGINEERS & SALES MANAGERS 2 POSITIONS (DUBAI & ABU DHABI)

### Key Responsibilities:

- Develop and maintain relationships with distributors, clients, contractors, and key stakeholders in the UAE.
- Promote and sell our range of HVAC products, including Chillers, VRF, AHUs, Rooftop Units, Splits, and related equipment.
- Lead generation through active networking and introduction to new customers.
- Manage and collaborate closely with the team of application engineers to achieve sales targets.
- Provide technical expertise and support to clients
- Keep up-to-date with industry trends and competitor products to stay ahead in the market.

### Requirements:

- Bachelor's degree in Mechanical Engineering
- 5-7 years of experience in sales engineering within the HVAC industry within the UAE.
- Fluent in English.
- Sales and networking skills
- Strong knowledge of HVAC equipment, including Chillers, VRF, AHUs, Rooftop Units, Splits, etc. ( compulsory )
- Excellent communication and interpersonal skills.
- Proven track record of meeting or exceeding sales targets.
- Preferable connections with key stakeholders in the UAE market

**Application Process:** If you are passionate about HVAC technology and have the skills and experience to excel in this role, we would love to hear from you. Please submit your resume and a cover letter detailing your qualifications and interest in the position. Contact [alissa@careersbay.com](mailto:alissa@careersbay.com)





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