

IS IEQ AN AFTERTHOUGHT IN RETROFIT PROJECTS?

While energy efficiency is a target of building-retrofit projects in the region, can the same be said of indoor environmental quality (IEQ)? **Hannah Jo Uy** has the story...

Part 1

Good indoor environmental quality (IEQ) lies at the core of human-centric design, with Dr Farheen Khanum, Environmental Geography, Director, Environment, Mruna DWC, emphasising that air quality can be likened to the respiratory system of a building. "Acoustics, lighting and quality thermal designs are also important components of IEQ that will lead us towards comfort and productivity and ensure the health of occupants, which is especially important in this changing climate," she says. In agreement is Majd Fayyad, Technical Manager, Emirates Green Building Council (EmiratesGBC), who adds that people are increasingly understanding that IEQ plays a major role in influencing wellness, health, productivity and happiness.

Such considerations are especially vital for stakeholders in the Middle East, says Ludovic Labidurie, CEO, EolisAir, in view of the region's climactic conditions. "The Middle East is mainly composed of sand, which bring a lot of PM 2.5," he says. "These PM 2.5 are known as a serious threat to human health, if we're exposed to a high concentration daily." Very aware of this phenomenon, Labidurie says that authorities have implemented stringent guidelines to address the issue, with the UAE taking a leadership role in this regard. Speaking on government initiatives in this space, Fayyad puts the spotlight on local Green Buildings codes and rating systems, such as LEED as well as the UAE's Estidama and Al Sa'afat codes, which



Dr Farheen Khanum



Majd Fayyad



Ludovic Labidurie



Gerald Stewart

take into consideration IEQ as a key element in the design and construction of new buildings. "All newly constructed buildings in Dubai and Abu Dhabi can be assumed to have adequate environmental IEQ for their design and construction features," he says. Fayyad also points out that the Prime Minister's Office at the Ministry of Cabinet Affairs and the Future has been awarded the WELL Certification at the platinum level by the International WELL Building Institute, further demonstrating government commitment towards improved IEQ.

HOW IEQ IS ESPECIALLY VULNERABLE IN RETROFIT PROJECTS

When it comes to the progress IEQ is making in retrofits, Dr Khanum says that while HVAC systems typically improve in the process of refurbishments, as equipment and designs are updated to meet new requirements, there is room for improvement. She highlights the need for more investment to enhance IEQ in retrofits. Fayyad adds that when it comes to retrofits, there are also inherent challenges while dealing with existing structures. "The opportunity to enhance IEQ lessens if consultants, designers and contractors are brought in much later stages in the project," he says. "For instance, designers need to specify low-VOC paints, sealants or adhesives to ensure good IAQ. Steps should also be taken to eliminate moisture levels, improve outdoor air rates and proper filtration. Hence, it is important to look at retrofit, sustainability and IEQ right from the beginning of the project or a building being repurposed."



Labidurie adds that, generally speaking, IEQ is the aspect that gets most negatively impacted by refurbishment, also citing the problem stemming from a drastic increase in harmful VOCs in such projects, as well as improper design and operational practices. “Taking into account IEQ when retrofitting a building is already a big step,” he says. “We’ve observed that sadly, sometimes the person responsible for a project doesn’t take into account the maintenance of systems or devices, which enable to drastically [improve] IEQ.” It is under these circumstances, he says, that IEQ is not appreciated as a core element that contributes to a better life.

Another issue is the unwillingness of stakeholders to invest. Gerald Stewart, Principal – Acoustics, Inhabit Group, says that while the Middle East has guidelines in place for IEQ, “it is still one of the first things to be commonly left out when it comes to projects”. Paul Schwarz, Technical Director of Dubai Acoustic Research Laboratory; Partner & Principal Acoustic Consultant in Design Confidence and Chairman, Middle East Acoustic Society, weighs in to add that so far, the regulations remain largely prescriptive, especially from an acoustic perspective. And Jens Lund, Managing Director, IT-Serve, sharing a similar concern, says, “There is a lot more awareness, talk and focus and we are headed in the right direction, but the biggest challenge is it stays with just talk and even worse, solutions get ‘value engineered’ out.”

‘YES’ CULTURE

This cost-centric thinking serves as the main bottleneck for better IEQ in the region, says Stewart. “If the rules and standards are in place, they should be seen through, no discussion, and the investor in the property and developer should have done their sums to start with,” he says. However, Stewart explains that often, building estimates are undercooked by hundreds of thousands of dirhams. “There are developers that come in and say, ‘I need a 50-storey building of class

X, Y or Z that is mixed use, and I have AED 350 million to spend,’” he says. “The first person the developers talk to that are willing to make it work for them will get the job, and they will then have to stitch it together. Whereas if they say, ‘AED 350 million is not enough for what you want, but we can do this, or this is an excursion that will allow 25 million for overrun, because you probably are not going to build it four or five years’, that is better instead of just saying ‘yes’.” Stewart stresses that the ‘yes culture’ permeating the industry is fundamentally shaping the region’s building stock. “Rather than buildings fit for purpose, we are making buildings fit for budgets,” he says. “This happens everywhere, but more so here. It’s the old adage of business: You cannot expect something better for less money.”

Jatin Sachdeva, General Manager, AU Pure, says that currently, IEQ in retrofits remains largely an afterthought, with many consultants and contractors largely reactive than proactive. He adds that while there are many solutions and technologies available in the market to address issues related to acoustics, light and air quality, the acceptability of these solutions are largely dependent on the building owner. “At the end of the day, it depends on whether the owner is looking at long-term value or short-term gain,” he says.

Labidurie says that while everybody has access to clear guidelines regarding good IEQ, “it remains something seen as an ‘extra’ and subject to the goodwill of persons responsible for refurbishment”. Stewart echoes this, when he says: “Buildings are supposed to be built according to local regulations and codes. In those documents, there is an IEQ requirement, but it’s not necessarily mandated. The problem is checking it upon completion. IEQ is designed, but when it comes to paying for it, it gets value engineered out.” Isolated floors, which are key for high acoustic ratings, he says, often fall victim to this. “It’s written into the rule books, but it is not mandated, and if it is



Paul Schwarz



Jens Lund



Jatin Sachdeva



Sangeetha B

not followed up, it’s almost like it’s optional and it can’t be optional,” he says.

ENFORCEMENT AND EDUCATION

For a shift to happen in the market, Lund believes enforcement is key, pointing out that in the United Kingdom, there are spot inspections in buildings to ensure MEP designs meet regulations. The Middle

East, he says, could greatly benefit from implementing such a follow-up mechanism. “That’s simply the human element,” he says. “If they can get away with it, they would – that is everywhere. But, if there is enforcement, you can see how quickly people would get it done.”

Fayyad also stresses the importance of such a mechanism, emphasizing that measurement of IEQ would be required to

verify that the buildings are operating to meet the building regulations.

In addition to calling for enforcement, Lund stresses the value of cultivating greater awareness. He says: “You need to have the person signing the cheque say, ‘I care more about the people than the building’. As of now, there is still a lack of education and understanding. You can buy VOCs to recreate that new leather smell, and





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for some of those products, it can even be carcinogenic. It's really bad, and the people that tend to drive it are not pushing the agenda." Sachdeva also highlights the importance of education. "Enhancing penetration of knowledge and understanding among consultants is the first level that must be addressed," he says. "As of now, it's a push, not a pull. The transition, where air quality becomes a pull, is still a few years away in the region. It is important to sow the seeds."

Additionally, Sachdeva points out that there is a lack of specialisation in the market, and that there are not enough consultants that have the necessary knowledge and experience when it comes to designing and retrofitting for IEQ. This is an understandable situation, he says, as consultants often have to be familiar with typically 30 or more different technologies at any given time. As such, Sachdeva says, it is important for specialists in the field, including

manufacturers, to provide the necessary support to consultants through workshops, seminars and better after-sales services.

The public sector could also greatly benefit from such collaborations, Schwarz says, adding that as the Middle East Acoustic Society, they have looked at approaching government entities to support the establishment of a review and enforcement vehicle similar to the Fire and Life Safety 'house of expertise' model in place in the early to mid 2000's, which was approved by the Municipality to look at Civil Defence matters up to a certain point," he says. "That paved the way for more efficient design applications and allowed specialists to weigh in, and it's a brilliant system. This is very possible for indoor air quality, where the municipalities could approve a number of experts to look at related issues."

Labidurie adds that experts could weigh in and recommend important indications when it comes to IEQ, including

concentrations of PM 2.5, VOC and CO₂, as well as lighting and acoustic levels for retrofits. "As we are indoor air quality specialists, we give special attention to the first three key indicators," he says. "In case consultants or/and contractors are brought later in the project, there are still solutions, which operate independently from a whole system, such as mobile professional air purifiers."

ENERGY EFFICIENCY AGGRAVATING IEQ

The increasing emphasis on energy efficiency, while positive from a sustainability standpoint, has negatively impacted the progress of IEQ in the region. Sangeetha B, Deputy Chief Executive Officer, Al Fajer, elaborates on the interesting dynamic between energy efficiency and IEQ. "Improving IEQ factors, like acoustic conditions, lighting and thermal comfort often meant increased energy consumption

in the past, but considerations, such as sustainability and net-zero energy profiles, demand a rethink," she says. "For instance, thermal insulation of building envelopes, which is one of the common energy efficiency measures, also impacts IEQ. While it improves thermal comfort, mitigates heat stress and shields from low indoor temperatures during winter, insulation can emit pollutants and also increase indoor humidity that can lead to microbial growth."

Fayyad says that currently, building retrofits mostly focus on reduction of energy consumption rather than IEQ improvement. "In many cases, the improvement of energy performance has led to deterioration of the IEQ, specifically when it included reduction of outdoor air rates," he says. Further, Fayyad notes that from an owner's perspective, improved occupant health and wellbeing are of lower priority compared to improved energy performance.

Sachdeva is in agreement, pointing out that current norms have fallen short of taking into consideration air quality, placing greater focus on energy management. "Air-tight buildings offer more challenges, and IEQ is often being compromised, leading to sick building syndrome," he says. Lund echoes this, when he says: "Energy efficiency is important, and these buildings get built so well, but the only issue is the fresh air. They don't let fresh air in, and there is a spike of CO₂, people get tired, and there can be up to 25% reduction in learning capacity. This is what I call the silent productivity killer."

In view of this, Sangeetha emphasises that making the right redesign choices is vital for FM operatives to address end-user expectations, while striking the right balance between IEQ and energy efficiency. Fayyad also points out that the private sector must continue to follow the benchmarks set by the UAE government and that more focus is required to incorporate IEQ improvements

in building retrofits. "Developers need to focus not only on energy efficiency but also approach green buildings from an IEQ perspective for the overall wellbeing of the occupants," he says. Lund agrees, pointing out that it is absolutely necessary to get IEQ under control, as very little is done to fulfill these needs. "There are no silver bullets," he says, "At the end of the day, many small streams make a big river." **ccme**

End of Part 1

(Considering that retrofitting for energy efficiency is largely driven by ROI from the savings, can the same financial case be made for investing in indoor environmental quality across the GCC region? Stakeholders weigh in and recommend potential business models in the April issue of *Climate Control Middle East*.)

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