

THE OFFICIAL JOURNAL OF AIRAH

AUGUST-SEPTEMBER 2020 • VOLUME 19.6

RRP \$14.95

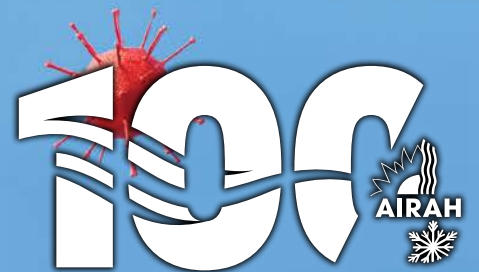
PRINT POST APPROVAL  
NUMBER PP352532/00001

# Ecolibrium



# And then?

Living with COVID-19,  
and what comes next.





# And then?

The onset of the COVID-19 pandemic has turned life as we knew it upside-down, both around the world and here in Australia. Although much of our nation has avoided the tragic health crisis we've seen unfold overseas, we face a new kind of normal in the weeks, months and possibly years ahead. **Sean McGowan reports.**

COVID-19 had reached our shores in low numbers during the first few months of 2020. But it was Friday, March 20, 2020 that will long be remembered as the day Australia closed its borders to all non-residents.

In the days following, the nation found itself grappling with the concept of “social distancing” as both state and federal governments scrambled to “flatten the curve”. Doctors and nurses became the front line, employers and

employees discovered new ways to operate businesses from home settings, children (and parents) adopted remote learning, and our CBDs effectively became ghost towns.

Many businesses suffered significant losses, and thousands of Australians found themselves unemployed. Sadly, illness and death was unavoidable.

Although some of this might be in our rear-view mirror now, the lasting

impacts have done more than just flatten the curve. As well as an economy battling to emerge from recession, we are all dealing with what many have dubbed “the new normal”.

Ecolibrium reached out to leading figures in our industry to ask about their experience, the impact on the HVAC&R and wider built environment industry, and what they believe this new normal might look like.

## EDITOR'S NOTE

At the time of writing, the Victorian government had announced a new lockdown for the Melbourne metropolitan area in an effort to control a second peak in COVID-19 cases. This event is not reflected in the comments of our contributors.



## THE ACADEMIC



Informal interactions and relationship-building ... have suffered, and we are yet to understand how much or in what way.

A structural engineer with close to 30 years' experience in design and construction, **Professor Brendon McNiven** leads the Melbourne School of Design (MSD) at the University of Melbourne.

He says that apart from the obvious hit to student numbers and income, the MSD has handled the impacts of the pandemic well.

"Everyone was surprised at how manageable the transition to online lectures and studios was," McNiven says.

But he warns that it is much too early to fully understand what the downsides and differences are. As *Ecolibrium* went into production, most of the country began its emergence from isolation. Melbourne, meanwhile, was pushed back to Stage 1 restrictions in an effort to deal with dramatically rising infection rates.

"Many people quote being busier and more efficient than ever," he says. "Informal interactions and relationship-building – which are important in business development – have suffered, and we are yet to understand how much or in what way."

An example is the pause placed on university life, and what that might look like for students in the immediate future. McNiven says despite the positive aspects around remote learning, there will be some who have found it challenging.

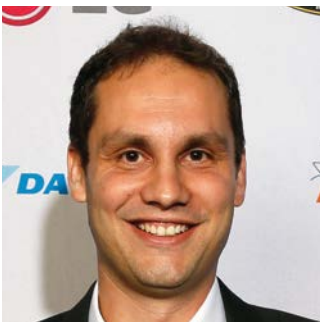
"Many students come to the University of Melbourne for the campus experience, and this has suffered," he says. "We will also find remote learning suits some students well and others not so well. And again, we are yet to understand the full extent of the downside."

With video conferencing platforms having been relied upon to help both business and education get through the social isolation measures, McNiven believes this technology is here to stay due to the benefits around ease and efficiency.

"Most people, even the introverts, crave a degree of face-to-face contact," he says. "However, this will remain the preferred way of operating."

For the wider construction industry, McNiven says the pandemic will inevitably change the way workplaces are designed. He expects hot desking to come under pressure due to hygiene concerns. Yet the pandemic may not spell the end of collegiate-style workplace fitouts such as activity-based working (AWB).

"Done properly, activity-based working has always had the provision of different types of spaces at its core," he says. "It will stay this way. However, the types of spaces may change. Less shared desks and perhaps stronger hygiene regimes, remote activated (connected) spaces and better kitted-out spaces in people's homes." ■



## THE SWISS EXPERIENCE



There is a need to have a higher intake of outdoor air to ensure faster removal of contaminants from the indoor space

Formerly a research fellow at the University of Wollongong's Sustainable Buildings Research Centre (SBRC), **Dr Massimo Fiorentini**, **Affil.AIRAH**, relocated his family to Switzerland just as the first few cases of COVID-19 began appearing in Europe.

After spending just a few days working at Empa, the Swiss Federal Laboratories for Materials Science and Technology, in Dübendorf, the organisation made an early decision to ask all employees to work from home. Soon after, the community was placed in effective lockdown.

"My everyday life, and that of my family, was obviously very much affected," Fiorentini says. "But I am lucky in that my job does not require my physical presence in the office for the majority of the time."

It wasn't until May/June that Dübendorf began transitioning to the current new normal, which he describes as a carefully organised return to normal life. A return to the workplace has required coordination of his team's presence at the office.

Fiorentini has observed the measures taken by Australia from afar, and says the return to a new normal is similar to that in Switzerland – along with the obvious impacts.

"The occupancy patterns of office buildings have changed as companies introduce measures to reduce density in offices to ensure effective distancing," he says. "At the same time, there is a need to have a higher intake of outdoor air to ensure faster removal of contaminants from the indoor space via mechanical or natural ventilation."

Organisations such as REHVA (Federation of European Heating, Ventilation and Air Conditioning Associations) have provided valuable advice to European countries on HVAC systems operation and maintenance.

"In the middle of the spread of the virus in Europe, REHVA published a guidance document on how to operate and use building services in order to prevent the spread of COVID-19 in workplaces," Fiorentini says.

"REHVA suggested, for example, avoiding air recirculation, increasing air supply and exhausting ventilation, and performing regular maintenance to the systems. Humidification and air conditioning were found to have no practical effect, as did duct cleaning or changing outdoor air filters." ■



## THE IEQ RESEARCHER



Concerns about the overall quality of indoor and outdoor environments delivered to people, and how it can protect or harm our health, are coming under the spotlight

Another who has changed employer in the midst of the COVID-19 pandemic, **Associate Professor Christhina Candido** has joined the MSD at the University of Melbourne after spending eight years at the University of Sydney.

She says the events of 2020 – the summer bushfire season and COVID-19 pandemic – have underlined the link between sustainability and health, and the crucial role the built environment plays. Concerns about the overall quality of indoor and outdoor environments delivered to people, and how it can protect or harm our health, are coming under the spotlight.

“For instance, preliminary analysis from my research looking into office building performance during the Australian bushfire season shows that indoor air quality (IAQ) reached five times the recommended thresholds during and after the fires,” Candido says.

“Results like this not only show that buildings and HVAC struggled to keep safe conditions indoors but also the lag in pushing the thresholds back to what they should be days after peak conditions. If anything, this is a wake-up call about the consequences we face of a high-carbon built environment but also the role data plays in moving forward.”

For this reason, Candido says an incredible opportunity now presents itself for academic, industry and the community more broadly to harness this concern and transform how the built environment is designed, operated and experienced.

And to this end, she says it is time to merge the health and sustainability agendas.

“The COVID-19 restrictions have provided us with a glimpse of the significant environmental benefits from us reducing our carbon footprint,” she says. “But for that to continue, we need to revisit how we work.”

Scaling up flexible working arrangements, reducing pressure on transportation and allowing people to achieve a better work/life balance are all possible outcomes in the new normal.

Preliminary data from Candido’s research shows that 67 per cent of surveyed workers would like to see an increase in flexible working arrangements post-isolation.

“That’s a significant result,” she says, “and organisations should not overlook numbers like this.”

She says while the physical office will still exist due to the need for – and value in – people coming together, a blended approach is long overdue and needed.

“It is time to move beyond the 9-to-5 culture and trust people to do their work,” Candido says. “Learning how to manage distributed teams and make the most of asynchronous communications is a must for managers and organisations in creating the digital office. After all, work is something we do not need a place to go to [to do].”

With much still to be understood about airborne transmission and how buildings and HVAC systems can deliver safe conditions for working indoors, Candido has joined the IWBI COVID-19 Task Force – a multidisciplinary effort tasked with fast-tracking this work. ■

## PONDERING THE PAST

“Many years ago, I worked on the ESD design brief for the Royal Children’s Hospital in Melbourne, and we pushed really hard for operable windows throughout,” says Ania Hampton, M.AIRAH.

“One argument for this was that during a pandemic, they allow for very quick flushing of the inside air. I’ve been thinking about that a lot these last few weeks.”

She says with an aerosol-spread virus like COVID-19, being able to quickly and effectively exhaust indoor air is vital.

“HEPA filters on return air systems will become normal and systems will need to be able to provide 100 per cent outside air when necessary,” she says. “But doing so without impacting energy consumption will require some innovation.”





## THE SMALL CONSULTANCY



Most HVAC systems are not designed to operate at very low loads, and efficiency takes a real dive

Having founded consulting firm Edifice more than a decade ago, **Ania Hampton, M.AIRAH**, says consulting has been relatively easy to adapt as Australia navigates the COVID-19 pandemic.

She says the ability to remain nimble and flexible, and ready to react to the unexpected, is part of the new normal. The dramatic change in operations has also enabled many companies to identify areas of their business that are performing, and those that are underperforming. This will allow for the rethink of business models and discovery of new opportunities.

“As a species we are a slow-turning ship,” Hampton says.

“There is much talk in the press that the office as we know it is dead, and that the suburbs are the new city, but things will go mostly back to normal faster than we may think.”

She says just as we have identified things we would be happy to leave behind from the pre-COVID world, we are also discovering that there is no substitute for face-to-face contact.

“I am really interested to see how this plays out – people seem to either love it (working from home) or hate it.”

The Edifice team faced its own challenges during social isolation, including managing the home-schooling of children while keeping up with work. With the team unsure how long they’d need to perform the dual role of teacher and engineer, Hampton says it made planning challenging.

She believes we will see a much higher variability in occupancy rates of commercial offices, and therefore the resulting impact on HVAC loads. For example, the large shared office space in which Edifice operates is currently at about 15 per cent occupancy.

“Most HVAC systems are not designed to operate at very low loads, and efficiency takes a real dive,” she says.

“Going forward, flexibility and the ability for fast ramping down and up will be important, as will the ability to turn off sections of the building without impacting system performance.” ■



## MECHANICAL SERVICES



Airborne transmission is not yet properly understood however evidence is mounting around the role that HVAC and air circulation can play in this

The role of the building and construction industry in the Australian economy has long been recognised by government. Importantly, it was identified early in the management of the COVID-19 pandemic as being vital to economic recovery.

Governments (both state and federal), industry and unions have all worked closely – perhaps more closely than ever before – to keep the industry building, and doing so as safely as possible.

And this includes mechanical services contractors such as A.G. Coombs.

“The industry by and large is still working on projects that commenced pre-COVID, but there is a significant drop-off in workload emerging across the industry,” says **Bryon Price F.AIRAH**, strategic development director at A.G. Coombs.

Price says maintenance of HVAC&R in buildings has also generally continued and although many buildings have low or no occupancy, A.G. Coombs has seen few fully shut down, with the exception of some retail and higher education facilities.

“There has been a good understanding among our FM clients that mechanical and HVAC maintenance generally needs to continue to support essential services compliance, safe cooling tower operation and asset condition, particularly for water systems.”

As the rate at which staff return to buildings for work varies around Australia, a range of facility management issues are yet to fully play out. For instance, Price says the requirement for social distancing creates access issues in lift lobbies and cars, as well as common spaces such as kitchens, bathrooms and lunchrooms.

And from an HVAC perspective, there are many considerations.

“People are expressing concerns around cleanliness and the role that HVAC systems have in maintaining a clean indoor environment,” he says. “There is a clear need for good communications, and HVAC&R providers have a role in assisting FMs with messaging for building occupants. Reality versus perception issues both need to be addressed.”

Additionally, the requirement for social distancing and low levels of occupancy, as well as the resulting low levels of heat in return air during winter, are causing issues with control of some older systems.

“Some systems are running longer due to staggered operational hours to separate teams,” Price says. “And some start-up issues have been reported with systems having been shut down for a period of time, leading to water and refrigerant leaks, air balance and control issues.”

Even the maintenance of NABERS Energy ratings have caused concern in some buildings, leading to NABERS issuing guidance to building owners, operators and assessors on how to manage ratings during periods of low occupancy and operation.

As for the management of HVAC systems with respect to the airborne transmission of COVID-19, Price says it’s a “wait and see” proposition.

“This is an emerging science,” he says. “Airborne transmission is not yet properly understood however evidence is mounting around the role that HVAC and air circulation can play in this. How to deal with it is far from resolved – but there are a lot of people looking at it globally.

“Different climates, different systems and different settings all may require a different approach, making it difficult for owners and operators to make decisions about exactly what to do.”

But Price expects an increased focus on indoor environment quality (IEQ) with more monitoring, testing and key performance indicators to be met; as well as particular focus on ventilation and airflows within conditioned spaces. This could mean more displacement ventilation systems compared to traditional top-down systems, and special attention paid to social distancing pinch points where people are in close proximity for periods of time.

“We can hope that a positive outcome of this (pandemic),” Price says, “is an increased understanding and appreciation of the connection between good IEQ and the quality of the HVAC design, installation, commissioning and maintenance.” ■

## CLOUDING THE ISSUE

“There are some products and services of spurious value being promoted, particularly around the cleaning of HVAC systems, fogging spaces and systems, and disinfecting airflows,” says A.G. Coombs Bryon Price, F.AIRAH.

“These serve only to confuse non-technical clients.”

Price points to the range of good guidance available from AIRAH, the IAQA, AMCA and A.G. Coombs’s own Advisory Notes as useful resources.

“While there is leading guidance from overseas organisations including ASHRAE, CIBSE and REHVA,” Price says, “it is important to understand some elements of this relate to northern hemisphere climates, and the resultant types of buildings and HVAC systems they have.”



## BIG CONSULTANCY



It could be argued that COVID-19 will inherently cause a shift ... towards systems with lower velocities/air quantities

According to the Australian CEO of Meinhardt, **Sean Treweek, F.AIRAH**, there have and will continue to be negative impacts felt in the design and construction side of the HVAC&R industry as business confidence stalls and projects are put or remain on hold.

“For the past few months, the industry has been in reactive mode,” he says. “But I’m certain that the world in 12 months’ time will be very different to the world 12 months ago.”

Treweek points to video conferencing and collaboration platforms, and the significant rise in remote and flexible working, as causing a fundamental shift in the way offices are occupied. Combined with the growth of online shopping and its detrimental effect on “bricks and mortar” retail, it is inevitable that there is a flow-on effect for the HVAC industry.

“At the moment, the fundamental impact of COVID-19 has weakened the industry,” Treweek says. “Longer term though, I have no doubt we will bounce back and emerge from isolation with a renewed vigour and a refined focus for the sector.”

Although he expects this focus to remain on sustainability, health and wellbeing, a shift to providing more visibility on what the sector is doing in the interests of infection control might be on the cards.

As for the pandemic’s impact on HVAC design, Treweek says changes may be far-reaching.

“It could be argued that COVID-19 will inherently cause a shift away from higher velocity air distribution systems and a move towards systems with lower velocities/air quantities such as displacement systems or chilled-beam-type

technology such that moisture droplets are not carried as far in an airstream,” he says.

“But these system types fundamentally change the financial model and building efficiencies within a development, so it will be interesting to see how the industry reacts over the longer term.”

With public sector investment in education and healthcare the likely kick-starter for the sector, shovel-ready projects will be the job-creators in the mechanical and building services sector.

“At the design end of the industry, the ramp-up may take a bit more time until the next wave of new projects comes online in the public sector, and business confidence improves in the private sector,” Treweek says.

“The fast-tracking of planning approvals is key to ensuring private sector developments move ahead, as well as the reopening of borders to stoke the demand-side economic drivers.”

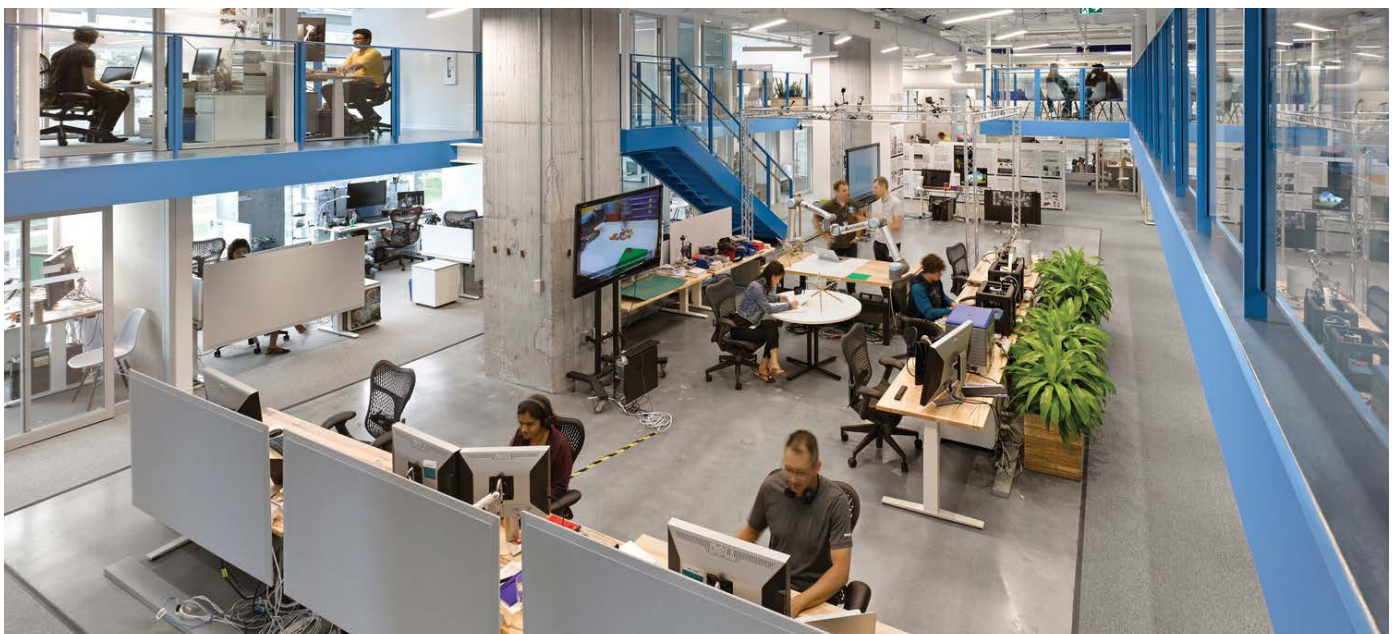
He expects significant investment to come from the data centre sector (due to the proclivity of remote working and associated data requirements), logistics and cold chain (to cater for growth in online shopping), healthcare and medical research/laboratories for obvious reasons.

“As significant users of HVAC&R,” he says, “there does present some opportunities for the sector.”

It’s something to hang our collective hard-hats on.

But with epidemiologists warning against expectations that the worst is over, the new normal is largely still to present itself.

Time, and only time, will tell. ■





## REFRIGERATION READY



We will certainly  
change how we  
consume and  
where food  
comes from

With its operations coming under the classification of an essential service, like much of the construction industry, industrial refrigeration contractor Cold Logic has continued to serve the food and beverage sector largely unaffected.

“Our major construction projects have continued unabated to meet the long-term deadlines for our clients,” says Cold Logic’s **Dr Michael Riese, M.AIRAH**.

While he says the service side of the business saw a slight downturn as clients deferred routine preventative maintenance and only allowed technicians onsite for emergency repairs, this work is picking up and resuming to normal levels.

Based in South Australia, Riese says the experience only served to validate a number of important decisions and systems the company had implemented pre-COVID-19 as part of business-as-usual. These include video conferencing and local manufacturing.

“The benefit of having a fully established Australian supply chain in the HVAC&R sector and supporting fields, with significant manufacturing capabilities inside Australia, has allowed us to continue to operate at near normal pace,” Riese says.

Believing there will now be a stronger trend towards more localised food production and processing – requiring additional plant capacity and equipment – Riese says Australia’s industrial refrigeration sector is well placed to make the best of the economic recovery.

The industry’s increasing ability to optimise energy use will also help to mitigate some of the potentially higher manufacturing costs incurred locally.

“People have not stopped eating,” he says. “But we will certainly change how we consume and where food comes from, particularly with international supply chains impacted as they are.” ■