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MARCH 2017

SG GREEN

SINGAPORE GREEN BUILDING COUNCIL

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BETTER PLACES FOR PEOPLE

SGBC-BCA Sustainability Leadership Awards

SGBC-BCA Sustainability Leadership AWARDS 2017

Uncovering the leaders of sustainability in the built environment, the SGBC-BCA Sustainability Leadership Awards is organised by the Singapore Green Building Council (SGBC) and the Building and Construction Authority (BCA).

The SGBC-BCA Sustainability Leadership Awards accords recognition to **individuals, organisations and project teams** for the contributions and achievements towards greater environmental sustainability in the built environment. The SGBC-BCA Sustainability Leadership Awards are awarded in three main categories:

Green Building Individuals to recognise individuals and professionals in the green building industry for their outstanding achievements and contribitions.

> Awards will be given in the following sub-categories:
>
> **Green Architect**
> **Green Engineer**
> **Green Advocate**
> **Green Innovator**
> **Green Facilities Manager**
> **Young Green Building Individual**
> **Green Building Organisations**

Business Leadership in Sustainability to recognise companies which truly integrate sustainability into their business models and contribute to the transition towards a sustainable built environment.

> There are two Sub-Categories under this Award Category:
>
> **Business Leadership in Sustainability**
> **Leadership in Green Building Product**

Leadership in Sustainable Design and Performance to recognise pioneering green building projects that deliver a range of benefits through a holistic approach to sustainability.

> There are three Sub-Categories under this Award Category:
>
> **Leadership in Sustainable Design & Performance (Residential)**
> **Leadership in Sustainable Design & Performance (Commercial)**
> **Leadership in Sustainable Design & Performance (Institutional)**

Nominations will be open soon. Please visit www.sgbc.sg for more information.

SG GREEN

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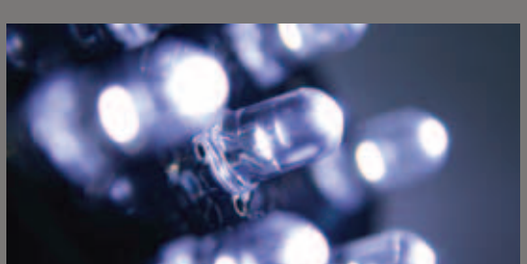


INDUSTRY INTELLIGENCE

MESSAGE FROM THE EDITORIAL TEAM

TOWARDS BETTER PLACES

There is little doubt that human beings spend the majority of their time indoors, whether it is for work, for play or just generally going about their daily lives. In highly urbanised Singapore, there are buildings as far as the eye can see: from lofty skyscrapers to refurbished shop houses that seem to be stuck in between time periods. Everywhere you look on our little red dot, there is a building.

Therefore, it stands to reason that the buildings we live in must be buildings we can live with, and that is the basis of the Better Places for People programme led by the World Green Building Council (WorldGBC). As an outreach programme, Better Places for People aims to educate and instil knowledge about green buildings to key publics in a manner that is easily relatable and actionable. Instead of churning out technical jargon that sound alien to the average office worker, Better Places for People distils crucial information about indoor environment quality and provides tips for building tenants and occupants to immediately make a difference to their surroundings.

Locally, the Singapore Green Building Council (SGBC) has started to rollout a series of activities based on Better Places for People content contextualised for our climate and landscape. Working with industry partners, SGBC hopes to reach out to Singapore's office workers for a start, sharing with them key insights from the WorldGBC's body of great research on the subject while also pointing occupants in the right direction if they wish to undertake measures to enhance their indoor environments.

In this Better Places for People issue of SG Green, we will showcase the programme proper, what are the key pillars and what are some of the things you can do to improve your office environment for greater productivity. We also have a collection of articles that touch on the different aspects of Better Places for People, including how lighting and appropriate indoor greenery can beautify environments while improving the health and wellbeing of its occupants.

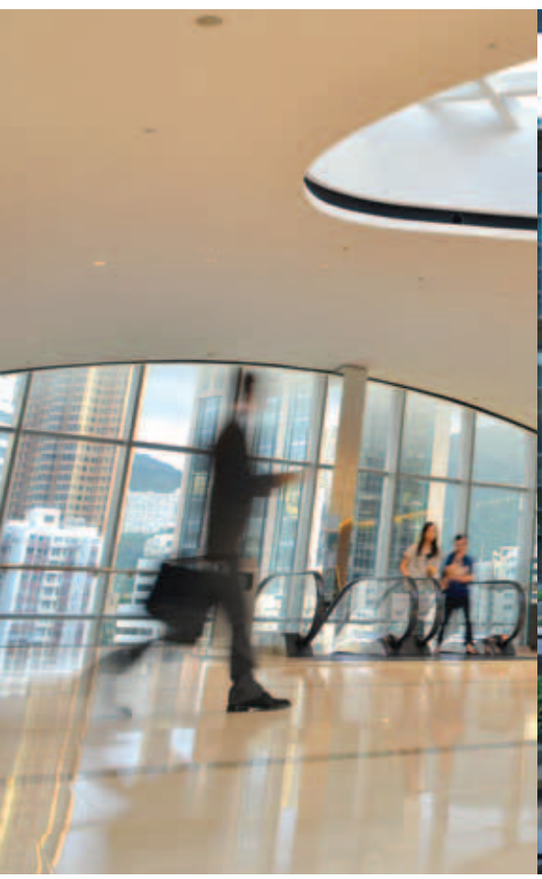
We hope that you will enjoy reading the articles contained in this issue and perhaps even make use of some of the tips within to create better places for people.

Yours sincerely,
SG Green Editorial Team

SINGAPORE GREEN BUILDING COUNCIL

BETTER PLACES FOR PEOPLE

PUT WELLBEING AT THE HEART OF YOUR BUILDING



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OVERVIEW

In any organisation, the staff is a crucial asset. No matter how automated processes have become, businesses still need that human factor to drive machinery, tend to customer queries or to simply make things work. Therefore, it stands to reason that an organisation's staff should be housed in healthy, efficient offices to maximise their efficiency and productivity.

Indeed, the focus in the business arena for the past few years has revolved around the much-lauded term: productivity. Many government incentive and assistance schemes are tailored to help local businesses become more productive, and therefore able to contribute more to Singapore's economy. However, most of the schemes are purpose driven, in that they are drawn up and implemented explicitly to address specific issues. Sending your workers for skill upgrade courses is great and all, but there is a more achievable way to quickly improve office productivity.

According to a growing body of research, staff members in any organisation typically account for 90 percent of business operating costs. Therefore, even a small improvement in staff productivity can translate to rosier news for the company's bottom line and competitiveness. This is especially crucial in today's highly cluttered and extremely competitive global marketplace, where consumers are spoilt for choice and companies have to put in more effort to raise their profiles.

Apart from their own homes, employees usually spend most of the day in their offices, hard at work performing the myriad of tasks that is essential to any company. Oftentimes, they pay little attention to their immediate surroundings, ignoring the bad lighting or the poor indoor air quality present in the very office they are spending a third of their day in. In recent years, as the global sustainability movement shifted into high gear, people are

becoming more aware of their surrounding environment, particularly in the buildings they spend so much time in. This growing trend is not confined to only employees: building owners, designers, developers and investors throughout the world that office design affects the health and wellbeing of occupants in many ways and that it is also a smart business move to construct healthy green buildings.

In the latest World Green Building Council Building the Business Case: Health, Wellbeing and Productivity in Green Offices Report published in October 2016, a survey of 200 Canadian building owners unveiled the following interesting factoids:

1. Healthy buildings are worth at least seven percent more than their conventional counterparts.
2. 46 percent of building owners said that healthy green buildings were easier to lease.
3. 28 percent said that these green buildings commanded premium rents.

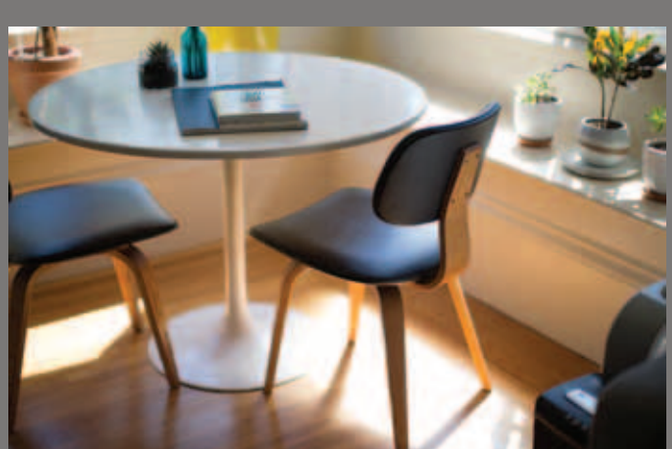
Therefore, not only is a green building a worthwhile financial investment, the intangible benefits provided to the occupants' health and wellbeing will more than make up for the initial capital outlay. In fact, the WorldGBC report also shows that employers who care about the environmental impact of their buildings as well as the health and wellbeing of their staff, and take action to improve the quality of the workplace, are rewarded by improved productivity and loyalty, which can be worth many times more than their investment.

Hence, creating Better Places for People is indeed the way to go.

WHAT IS A BETTER PLACE FOR PEOPLE?

In the simplest terms, a better place for people simply means that a building's occupant feels comfortable just by being in the room or building. A number of factors govern the quality of the interior environment, and each of these factors play key roles in determining whether or not you will continually sneeze in this auditorium or feel that the temperature is just right at the office.

Together, these factors form the tenets of the Better Places for People initiative launched by the World Green Building Council, aimed to raising awareness of what constitutes a healthy place to be in and how green building can help. On the local front, the Singapore Green Building Council has localised the programme and for a start, will be bringing it to office tenants and occupants.



STAYING AHEAD OF THE CURVE

This is particularly poignant in this day and age, where the general consumer has become more aware of environmental issues and are increasingly concerned about their own personal health and wellbeing. The modern consumer is also more technologically-inclined, turning to "smart" devices and other technology to receive updates about environmental trends or to help them lead healthier lifestyles.

For example, in order to combat the annual haze that plagues Singapore, consumers have become more discerning in their purchase of products that can help alleviate the stigma. As opposed to simply buying regular facemasks to filter out the harmful air particles, many consumers opt to go for purpose-made filtered masks that are able to block out fine particulate matter (PM2.5) that pose significant concern to health. Even though these masks are pricier than regular ones, consumers see it as a necessary expenditure to preserve their health, their awareness on this issue bolstered by public education campaigns as well as ready accessibility to concrete information.

The National Steps Challenge organised by the Health Promotion Board (HPB) is another example of the increasing onus placed by consumers on their own health and wellbeing. Ostensibly a rewards programme tagged to physical performance reflected by a steps tracker, the programme has seen enough traction and take-up to warrant a second season, suggesting that the regular consumer will take the extra effort to keep fit if technology is able to help them do so. One of the main draws of the Challenge is the seamless transfer of tracked steps

from the steps tracker to the smartphone app, allowing consumers to claim their rewards or see how far they have walked with just one tap of a button.

Despite this increased emphasis on personal health and wellbeing, the general consumer often overlooks a key component that has a direct impact: our buildings. As we go about our daily lives, we are always in some form of building to live, work and play in. We sleep inside a building, we work inside a building and we also derive recreation inside a building, most of the time at least. Therefore, it stands to reason that the buildings we are in have to be healthy and productive, so that the occupants within remain healthy and productive as well.

There is still a substantial gap in knowledge and awareness on how buildings can help improve personal health and wellbeing. More often than not, consumers are only aware of the more tangible things like greenery and lighting, while having only a fleeting understanding of how indoor air quality or the interior layout of an office workspace can play vital roles in improving occupant health and wellbeing. A healthy office environment is also crucial in helping to attract and retain the best talent.

This is the basis of the Better Places for People programme.

TENETS OF BETTER PLACES

WorldGBC, through rigorous research, has identified seven features that will create greener and healthier offices.

SEVEN FEATURES FOR HEALTHIER AND GREENER OFFICES

01 INDOOR AIR QUALITY (IAQ)

Healthy offices have low concentrations of CO_2, VOCs and other pollutants, as well as high ventilation rates.

101%

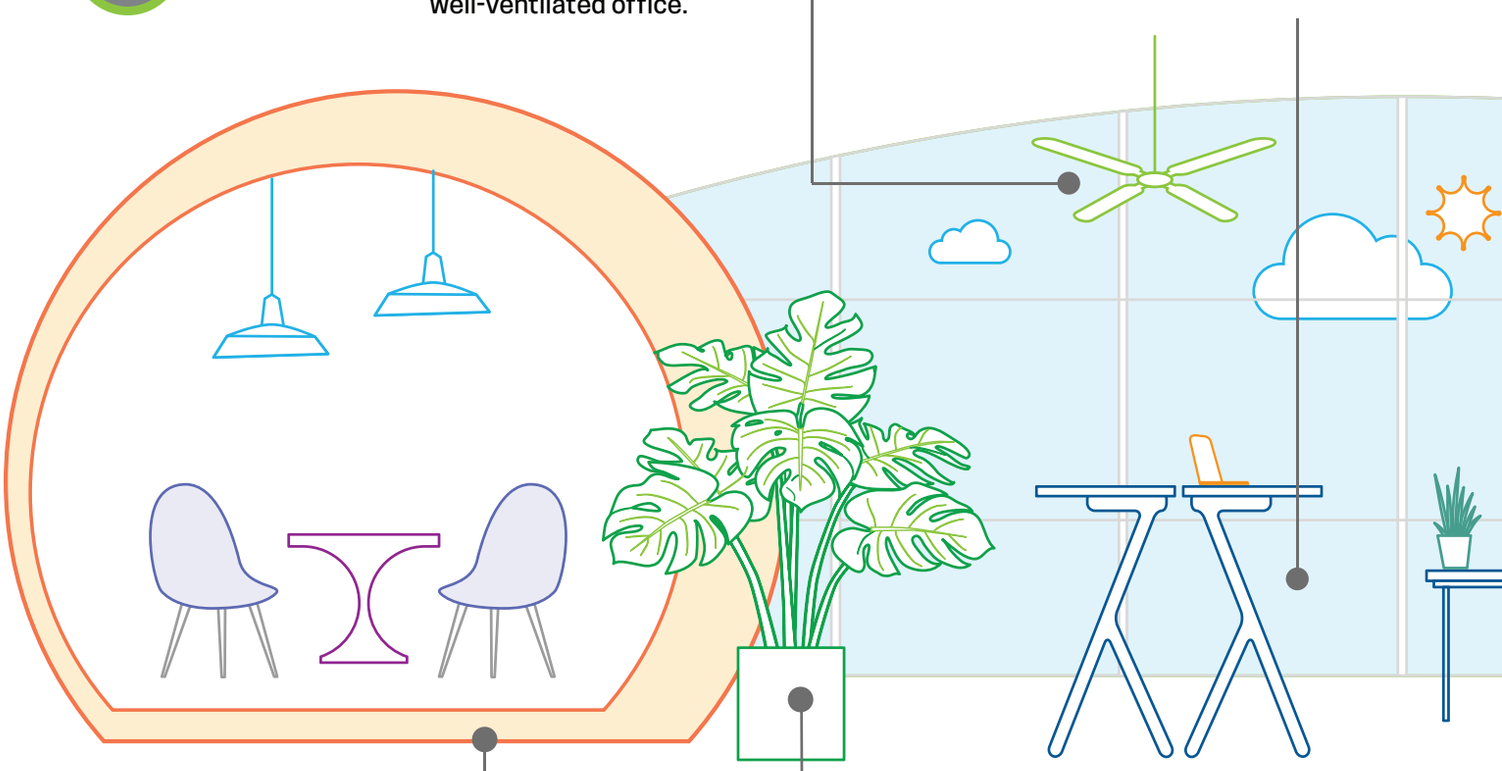
WHY?
increase in cognitive scores for workers in a green, well-ventilated office.

02 THERMAL COMFORT

Healthy offices have a comfortable temperature range which staff can control.

6%

WHY?
fall in staff performance when offices are too hot and 4% if too cold.



05 INTERIOR LAYOUT AND ACTIVE DESIGN

Healthy offices have a diverse array of workspaces, with ample meeting rooms, quiet zones, and stand-sit desks, promoting active movement within offices.

WHY?
Flexible workspaces help staff feel more in control of their workload and engenders loyalty.

06 VIEW AND BIOPHILIA

Healthy offices have a wide variety of plant species inside and out as well as views of nature from workspaces.

7-12%

WHY?
improvement in processing time at one call centre when staff had a view of nature.

03 GOOD LIGHTING

Healthy offices have generous access to daylight and self-controlled electrical lighting.

WHY?

46 minutes

more sleep for workers in offices near windows.

04 NOISE AND ACOUSTICS

Healthy offices use materials that reduce noise and provide quiet spaces to work.

66%

WHY?

fall in staff performance as a result of distracting noise.

EMPLOYEE ENGAGEMENT

Healthy offices have employees that are regularly consulted and that feedback is used to drive continuous improvement.

07 LOCATION AND ACCESS TO AMENITIES

Healthy offices have access to public transport, safe bike routes, parking, and showers, and a range of health food choices.

€27m

WHY?

savings through cutting absenteeism as a result of Dutch cycle-to-work scheme.

INDOOR AIR QUALITY (IAQ)

WHAT IS INDOOR AIR QUALITY?

Indoor air quality refers to the value of air purity within and around buildings, relating especially to the health and comfort of building occupants. Substances such as carbon dioxide, volatile organic compounds (VOCs), mould and bacteria in the air we breathe in can have adverse effects on our health and wellbeing, particularly after periods of prolonged exposure.

Healthy offices have low concentrations of these harmful substances as well as high ventilation rates. Workers in such offices report a 101 percent increase in cognitive scores, improving their productivity while also lessening their absenteeism rate.

To improve the indoor air quality of your office, specify for office interior fit-out products that have low concentrations of harmful substances. Ensure that these products have a valid green certification issued by an authorised body, such as the Singapore Green Building Product labelling scheme administered by the Singapore Green Building Council.

In addition, you can also install carbon dioxide sensors in your office to give you a better idea of how clean the air in your office is before taking the appropriate corrective measure. Growing of certain indoor plant species can also help to absorb VOCs and cleanse the air. Lastly, ensure that your air-conditioning units are regularly maintained to prevent a build-up of harmful substances like mould and bacteria.

THERMAL COMFORT

WHAT IS THERMAL COMFORT?

Thermal comfort is achieved when the combination of temperature and humidity in your immediate surroundings are just right. In Singapore, this is assessed by subjective evaluation based on Singapore Standards 554. All buildings undergoing assessment for the Building and Construction Authority's Green Mark Scheme will have to pass this thermal test as part of the evaluation process.

Healthy offices enable their staff to control the temperature of their immediate surroundings to achieve the ideal range they feel most comfortable in, recommended to be in the range of 24-26 degrees Celsius. The WorldGBC report shows that staff report a 6 percent fall in staff performance if offices are too hot or too cold but increase their productivity by 3 percent if they are able to control their local climate. Ideal temperatures can also be achieved by a combination of air-condition and fans. This way, more energy savings can also be gained.

GOOD LIGHTING

WHAT IS DAYLIGHTING AND LIGHTING?

Daylighting is the practice of positioning windows, openings or reflective surfaces such that natural daylight provides effective lighting for the interior of a building. When actively incorporated into building design, daylighting is able to maximise visual comfort for its occupants or reduce energy use. In workplace design, natural daylight is the most wanted element as it improves mood, reduces stress and has a positive impact on circadian system functions. Studies indicate that adequate exposure to daylight can result in 46 minutes more of quality sleep at night.

Healthy offices have abundant natural daylight with building features to maximise exposure. Self-controlled artificial lighting is also a key feature of healthy offices, and these have to be glare-free, energy efficient and flicker-free with appropriate lighting controls installed for individual workers to freely adjust their levels of illumination for different tasks and use scenarios. Not only will staff feel more productive, less energy is also wasted on lighting unused areas of the office.

NOISE AND ACOUSTICS

WHAT IS NOISE AND ACOUSTICS?

Noise and acoustics refer to the aural environment of the office, whether there are sufficient quiet spaces for staff to perform tasks away from distracting noise. Studies report a 66 percent drop in staff performance as a result of distracting noise. Therefore, it is pertinent to use sound absorptive materials (floor/wall coverings, office furniture, etc.) in the office while also zoning out the office based on the various activities. Also, consider designating quiet spaces or dedicated booths for phone calls, while keeping noisy office equipment away from open office areas.

INTERIOR LAYOUT AND ACTIVE DESIGN

WHAT IS INTERIOR LAYOUT AND ACTIVE DESIGN?

Interior layout largely refers to the visual appeal of a workspace, a major factor in workplace satisfaction especially within the younger demographic. More than two-thirds of Generation Y workers report an increase in productivity when their offices are fit-out in a "funky" manner.

Apart from the visual appearance of the workplace, healthy offices have many different sections and workspaces for employees. From ample meeting rooms to quiet rooms and stand-sit desks, such office spaces promote active movement within the office. This flexibility helps staff feel more in control of their workload, and this in turn engenders employee loyalty.

Healthy offices should be designed to accommodate the various needs of staff, while having a layout that facilitates easy interaction, discussion and collaboration with sufficient spaces for privacy and focus. Different space designs can also be incorporated to match the requirements of different tasks and also to mitigate noise levels.

Office equipment can also help with interior layout. Select office furniture that provide flexibility in the adjustability of equipment as well as different working options, for example, standing desks. It is also good to consider the ergonomics of the furniture, especially those where staff will spend protracted periods of time in.

VIEW AND BIOPHILIA

WHAT IS BIOPHILIA AND VIEW?

As introduced by Edward O. Wilson in 1984, biophilia is defined as "the urge to affiliate with other forms of life". In building terms, it simply means to bring nature into man-made spaces. Studies have shown that concentration levels in workers increase if there is greenery in the office. In addition to enhancing the view of office employees, certain species of indoor plants can also absorb harmful VOCs and purify the air.

Views of nature have been shown to improve employee wellbeing and productivity. At a call centre, staff reported a 7-12 percent improvement in processing times when they had a view of nature. Greenery and views of nature can come in the form of green roofs, vertical gardens and indoor plants incorporated into the building design or office environment.

It is important to select plants that are hardy and require lesser maintenance in the office (*see page 56 for a selection*). In addition, use only organic fertilisers and pesticides, if needed.

LOCATION AND ACCESS TO AMENITIES

WHAT IS LOCATION AND ACCESS TO AMENITIES?

Given a choice, employees would choose a workplace with shorter commutes to reduce the time taken to get to and off work. Oftentimes, employees have to work around long commuting times, especially if using the public transport network. Therefore, the office's location and access to amenities is important to attract and retain staff.

Healthy offices have good access to the public transport network, safe bike routes, ample parking, and shower facilities, as well as a range of healthy food choices within a stone's throw from the building. Ancillary services like childcare centres are also crucial considerations for the modern employee.

Apart from the more tangible features, intangibles such as health policies and benefits (e.g. fruits day and healthy snack corner), workplace family support, incentives that encourage greater levels of physical activity through reimbursement of gym membership all play a part in improving the wellbeing and productivity of staff members. Employers can also consider allowing flexible work arrangements for staff members, especially those with family commitments.

GREEN MARK SCHEME

GREEN MARK SCHEME

The Green Mark Scheme is a building certification programme administered by the Building and Construction Authority (BCA), assessing buildings for their performance and impact on its immediate environment. The Scheme is further sub-divided into several different categories, each looking at a specific type of building and their usage, e.g. New Buildings, Existing Buildings, Office Interiors. Although the Green Mark Scheme encompasses a host of other factors including energy efficiency and resource management, usage of certified green building materials will help the building or office to achieve a higher Green Mark rating, which translates to a more productive workplace environment.

The Singapore Green Building Council (SGBC) runs a dedicated certification programme for green building products. The Singapore Green Building Product (SGBP) labelling scheme evaluates and assesses building materials for their environmental performance based on a stringent set of criteria rooted in sustainability. The SGBP's tiered rating levels is a clear indication of a product's environmental performance, allowing end-users to make informed building decisions. Products certified by the SGBP labelling scheme are also catalogued on an online directory, making it easy for green building products to be searched and utilised.

As an outreach programme pioneered by the World Green Building Council, Better Places for People will continue to raise awareness of healthy, productive offices achievable by building green. In Singapore, SGBC has adapted the Better Places for People programme for the local context, with a number of tenant engagement sessions organised with programme partners already in the pipeline.

For more information, please visit http://www.sgbc.sg/resources/better-places-for-people

Images courtesy of World Green Building Council.

3-MIN WALK FROM POTONG PASIR MRT

Resort-style facilities

Artist's impression

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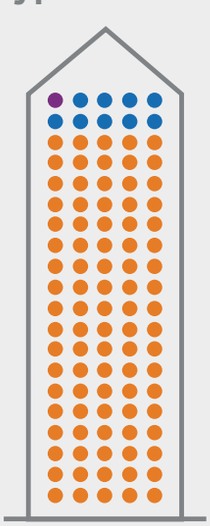
BETTER PLACES FOR PEOPLE :

TIPS FOR GREEN & HEALTHY OFFICES

SINGAPORE GREEN BUILDING PRODUCT SGBC

Typical business operating costs



- **1%** Energy costs
- **9%** Rental costs
- **90%** Staff costs in salaries and benefits

Did you know?

- Most people in developed countries spend over 90% of their time indoors
- Staff costs, including salaries and benefits, typically account for about 90% of business operating costs
- Better staff health and wellbeing has a significant impact on increasing productivity, reducing costs and therefore enhancing business performance

Staying ahead of the curve:

- People are interested in their own health. The consumer health market is expected to grow by 50% within 5 years
- The office environment is vital in helping to attract and retain the best staff

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Office Layout

- Design office environments to accommodate various staff needs.
- Have a layout that facilitates easy interaction and collaboration, with sufficient spaces for privacy and focus.
- Incorporate a diversity of space designs to suit different tasks and to mitigate noise levels.
- Provide social spaces for improved staff wellbeing.

Lighting

- Maximise and tap on natural daylight where possible. Studies indicate that adequate exposure to daylight can result in 46 minutes more sleep time per night.
- Enable lighting levels to be adjustable with changes in lighting levels to suit different tasks and use scenarios.
- Provide staff with local control of lighting levels at workspaces.

Indoor Air Quality

- Use materials with low levels of Volatile Organic Compounds (VOCs). VOCs are gases that can cause adverse health effects. They are emitted by building materials such as paints & adhesives, and office equipment such as copiers & printers.
- VOC concentration is generally higher indoors than outdoors (up to 10 times). Side effects of VOCs exposure include eye, nose and throat irritation, headache, nausea, damage to liver, kidney and central nervous system.
- The use of sensors enables VOCs, carbon dioxide and humidity levels to be monitored and actions to be taken accordingly.
- Optimise ventilation by providing fans where necessary and by arranging furniture without restricting airflow.
- Clean surfaces and vacuum cleaners regularly to limit dust and dirt accumulation.
- Remove contaminated materials and address moisture sources promptly to prevent mould growth.

Thermal Comfort

- Maintain room temperatures at a comfortable level, recommended to be in the range of 24°C to 26°C.
- Where possible, enable personal control of local climate. Studies have shown an increase in productivity by at least 3% when staff are able to control the temperature of their immediate surroundings.

Office Furniture

- Select office furniture that provides flexibility in adjustability of equipment as well as different working options e.g. standing desks.
- Consider the ergonomics of furniture, especially those where staff will spend a prolonged time in.

Greenery

- Views of nature have been shown to improve wellbeing and productivity. Green roofs, vertical gardens, indoor plants etc. can be incorporated into the building design or office environment.
- Indoor plants can help to improve the air quality by filtering harmful gases and pollutants.
- Choose and use plants that are hardy and require less maintenance.
- Use organic instead of chemical fertilisers and pesticides where needed.

Staff Wellbeing

- Consider flexible work arrangements and working hours to enhance staff wellbeing.
- Encourage regular rest of eyes from screen time. Besides improving eye health and reducing myopia, this has been shown to improve productivity by 7-12%.

About SGBC

The Singapore Green Building Council is a public-private partnership established to advocate for green building design, practices and technology to create better places for people to live work and play in.

WORLD GREEN BUILDING COUNCIL

WALKING THE TALK

As the first Singaporean to chair the Board of Directors of the World Green Building Council, Mr Tai Lee Siang is an eminent figure in the green building circuit, known for his leadership in the green building movement and dedication to improving the sustainability of buildings, both in Singapore and at the global level. SG Green sits down with Mr Tai to learn how he walks the talk.

TELL US A LITTLE BIT ABOUT YOURSELF.

I was trained as an architect and graduated from the School of Architecture, National University of Singapore in 1987. I recalled that the word "sustainability" was not even mentioned in our education and curriculum. However, there was a lot of emphasis on passive architecture with minimum reliance on energy.

WHAT IGNITED YOUR PASSION FOR GREEN BUILDING?

In 2006, I had the opportunity to watch "The Inconvenient Truth" - an environmental documentary by Al Gore, the 45th Vice President of the United States of America. I felt the evidence presented on global warming was compelling and decided that I should play a part. In 2007, I was elected President of the Singapore Institute of Architects (SIA). In my maiden speech presenting the SIA Manifesto, I spoke about the importance for architects to design sustainably. Since then, I have not looked back on this epic journey to champion for green building.

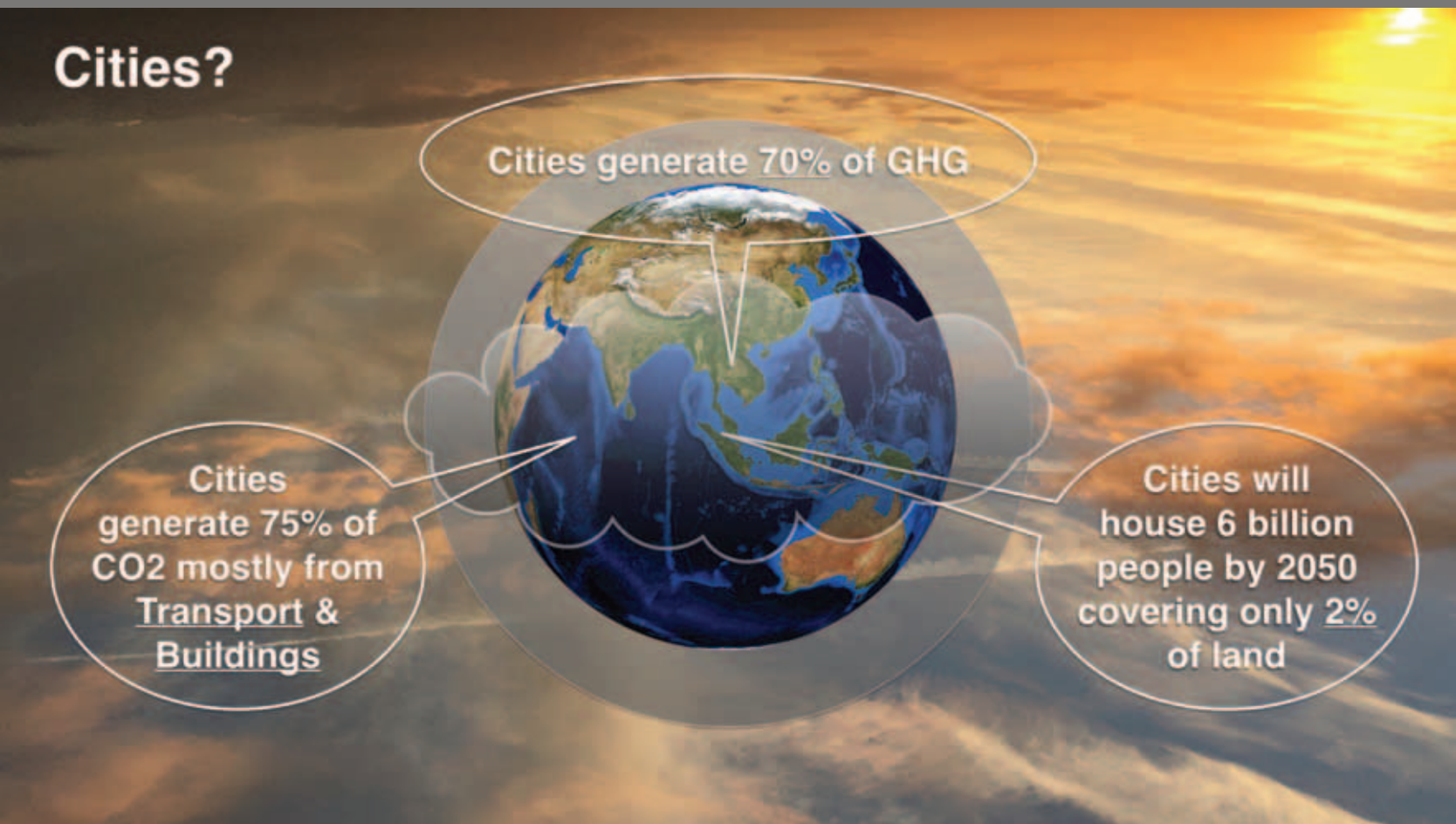
HOW WOULD YOU DESCRIBE THE PRESENT GREEN BUILDING MOVEMENT IN SINGAPORE AND ALSO AT THE INTERNATIONAL LEVEL?

Singapore, in my opinion, is definitely on the forefront of the global green building movement. The Building and Construction Authority or BCA took on the leadership role to set the target to green 80 percent of our existing building stock by 2030. Additionally, there is good synergy between public and private sector organisations best demonstrated by the Singapore Green Building Council's efforts to bring both harmoniously together.

The green building movement is definitely a lot less even at the international level. This, in part, is due to the uneven progress of market transformation in less developed economies. The other reason is the lack of vision and commitment by governments. Despite this, there are some highly progressive countries that seek to break new grounds to develop cutting-edge green developments such as Net-Zero cities and highly-rated green buildings. This unfortunately is the exception rather than norm.

WHAT DROVE YOU TO TAKE UP THE MANTLE AS THE WORLD GREEN BUILDING COUNCIL'S CHAIRMAN? WAS THERE A SPECIFIC EVENT THAT INSPIRED YOU?

WorldGBC is a global NGO that works closely with all its country members, counting more than 70. There is great synergy, diversity and inclusiveness at the Board of Directors to try to achieve its global vision. When there was an opportunity to run for the chair position in 2014, I wanted to take on the challenge to work with all the wonderful colleagues



to accomplish our mission. My fellow directors gave the vote of confidence and I was elected officially as chair by mid-2016.

WHAT ARE YOUR TOP THREE PRIORITIES AS CHAIRMAN? WHAT DO YOU HOPE TO IMPROVE OR CHANGE DURING YOUR TERM?

As part of my election, I proposed 3 priorities:

1. Strengthen and increase membership
2. Create an inclusive environment for greater participation
3. Strengthen our financial positions

I hope to increase our total number of members to 100 within two years. To date, we have 74. This will take tremendous effort as the remaining countries who are not yet members are usually economically challenged. I also hope to speed up the progress of membership status from the Prospective level (basic tier) to the Established level (highest tier). A higher number of members with Established status will increase the strength of the organisation.

WorldGBC is also reviewing governance management of its operations to make it easier for more GBCs to participate in the various initiatives and functions. Finally, WorldGBC is now actively diversifying its income to reduce the burden of high dependence on membership dues as the main income. This will increase staff capacity and support for members.

TO YOU, WHAT ARE THE THREE MAIN CHALLENGES IN GREEN BUILDING? HOW WILL YOU OVERCOME THESE CHALLENGES?

There are probably more than there, however, I will name a few.

Firstly, understanding the business case. The additional cost needed to build green buildings has reduced significantly over time. However, there is a need to work towards neutralising this mind-set. Moving forward, GBCs need to make the business case even more convincing than what it is today i.e. green building gives better returns on investment.

Secondly, there is an urgent need to raise the awareness of sustainability and green buildings amongst users. This can be achieved through more campaigns, publicity and education. When the market demand for green buildings increases, the motivation to develop green buildings will be strengthened.

Thirdly, change the urban paradigms that are questionable. Today, many buildings are built in environments that are highly unsustainable. Traffic congestion is one such example. The green building movement can only be decisively won when cities are also fundamentally changed. Such change can then draw out the maximum benefits and efficiency of green buildings. However, this will require massive collaboration by the three sectors: Public, Private and People.

HOW CAN THE GREATER PUBLIC HELP TO ACCELERATE AND DRIVE ADOPTION OF GREEN BUILDINGS?

Public opinion is very important in shaping change. When the public demands better and healthier environments, new laws and policies will be enacted by governments. Developers and consultants will endeavour to deliver what the market wants. Moreover, members of the public can also help to develop a ground-up culture that promotes a greener lifestyle. Such culture will go a long way to making green buildings a part of the social fabric.

IN TERMS OF SUSTAINABLE CITIES, WHAT MORE CAN SINGAPORE DO?

Singapore has achieved much as a sustainable city within a short time span of 50 odd years. Despite the high population of about 5.6 million and small land size of about 700 square kilometres, Singapore strikes a good balance between urbanisation and integration of nature.

The efficient urban transportation system, however, did not prevent increase in car ownership and traffic congestion during peak hours. I am of the opinion that Singapore can do more to create live-work-play co-existence to minimise cross-island movements of population. Once this conundrum is removed, there

SUSTAINABLE & ENVIRONMENT-FRIENDLY ISLAND

SINGAPORE AS A MODEL OF SUSTAINABILITY AND ENVIRONMENT-FRIENDLINESS

Singapore always aspires to be the best in the world. Singapore has one of the best airlines, airports, seaports and many others. Why isn't she the best in environmental sustainability and friendliness? Given the good infrastructure of environmental policies such as clean and green campaign, city in the garden status, Active Beautiful Clean Waters Programme etc, Singapore is poised to be the most environmentally friendly city in the world.

There are strategic issues that Singapore has to tackle before we reach the tipping point. Today, our carbon emission is still one of the highest in the world due to thriving economies. There is an urgent need to review our green policies and excessive dependence on air-conditioning. The development of green and eco-friendly buildings is formative. There must be an overwhelming change in mindset to acknowledge global environmental concerns and embrace new directions bravely. The clear and present danger of global warming must be tackled aggressively to firmly placed Singapore ahead of other cities in ensuring not just our survival but also setting an example for other cities to follow.

Given 699 sq km of well-planned infrastructure of green and blue spaces despite high density living, Singapore has one of the best environment policies in the world. The incremental efforts to level up will now involve active participation of private sector developments and public housing projects.

Manifesto 2007

is tremendous opportunity to increase nature in the city and family-friendly environments, thus achieving better work-life balance. The other area that Singapore can do more is to engage the citizens in shaping the future of Singapore's physical landscape. Such ground-up involvement will ensure that our efforts will make a great city sustainable.

WHAT ARE YOUR PLANS TO FURTHER GROW THE GREEN BUILDING MOVEMENT?

For 2016 and 2017, WorldGBC's focus is to complete the governance review and stabilise its financial management. We are in good position as of end 2016 and should see the completion of these efforts by mid-2017. This will be a good milestone to further strengthen the movement. My aim is to make WorldGBC a truly global organisation. This means that we have to ramp up our efforts to increase the number of new members. WorldGBC must achieve a critical mass and voice at the global stage. This means that WorldGBC must try to reach a 100-member organisation as soon as possible.

The next area of change is to make WorldGBC an inclusive organisation that brings in members and partners who can decisively impact the built industry. This may include members from other industries such as marketing communications, finance and legal. There is a need to explore strategies that can bring an avalanche change as time to combat climate change is shorter by the day.

AS THE FIRST SINGAPOREAN TO BE THE CHAIRMAN OF THE WORLD GREEN BUILDING COUNCIL, WHAT ARE SOME INSIGHTS YOU CAN OFFER TO OUR LOCAL GREEN BUILDING COMPANIES?

In Singapore, we have a good government that takes the lead to bring market transformation to the green building movement. As a result, Singapore is ahead of the green curve of global development. We have some of the best green buildings, consultants and expertise. In the meantime, the rest of the world is still finding their footing in growing their green industry.

Singapore green building companies should take the opportunity to venture overseas and contribute towards the market transformation of these emerging green economies. In this way, Singapore companies can seize the chance to grow in scale and contribution.

A CONNECTION TO THE WORLD IN THE ASIA PACIFIC

With Green Building Councils (GBCs) in over 70 countries and 27,000 member companies, the WorldGBC is the largest global network advancing green building. To accelerate and derive cross-beneficial programmes and initiatives, the WorldGBC clusters member GBCs into Regional Networks.

Regional Networks are powerful, collaborative platforms where GBCs can effectively exchange knowledge, generate new ideas and design solutions that speed up green building in their own markets and across the region.

Regional Networks also allow GBCs to address the challenges and opportunities that are most relevant to their regional context (e.g. renovation in Europe, or new buildings in Africa), thereby focusing their work where it can have the most impact.

REGIONAL NETWORKS HAVE BEEN PROVEN TO:

- Accelerate the development of GBCs by enabling WorldGBC to work more closely with them to build their capacity in areas such as leadership, education and industry best practice, so they are best-equipped to transform building within their own countries.
- Increase their impact by providing the platform through which successful green building programmes can be scaled-up and replicated across different countries – and at the same time creating stronger alignment within the green building movement.

- Strengthen collaboration by creating a regional mechanism through which national GBCs can collaborate with other multilateral and regional entities such as UNEP, WRI, development banks, the EU and other organisations with a common mission.

THE ASIA PACIFIC REGIONAL NETWORK

60 per cent of the world's population (4.3 billion people) already live in the Asia Pacific region, with more than 2 billion living in urban areas. In fact, the region has 16 of the world's 28 mega-cities (cities with 10 million or more inhabitants). The urban population is expected to reach 3.3 billion by 2050, adding further demand for buildings.

Set against this backdrop of huge growth, creating buildings that are low or zero carbon is essential to ensure a high quality of life for people, minimise negative impacts on the environment, and maximise economic opportunities. GBCs in our Asia Pacific Network are responding to these challenges and opportunities on the ground.

To consolidate and focus the various GBC efforts into cohesive, synergistic and mutually beneficial programmes, the WorldGBC has appointed Ms Joelle Chen as the first full-time Regional Manager for the Asia Pacific Regional Network as of January 2017.

Her appointment comes as a result of successful fundraising efforts led by the Asia Pacific Regional Network in 2016, and thanks to support from Founding Regional Partners AGC Asia Pacific Pte Ltd and LG Electronics.

Joelle practiced as an architect before heading back to B-school for her MBA, focusing on marketing and strategy. She later headed up the Smart Sustainable Cities team at the Economic Development Board (EDB) in Singapore, and launched several industry initiatives for the green building sector, including a world first, multi- stakeholder platform called "Pre-Project Innovation Consortium", championing integrative design approaches for sustainability.

Joelle thrives in the intersection of architecture, environmental sustainability, innovation and business, and is passionate about consistent experiences in brands, businesses and buildings.

She will be leading WorldGBC's Asia Pacific Regional Network of member Green Building Councils in 15 countries, which are focusing on strengthening

the green building business case for investors, understanding the role that health, wellbeing and productivity plays in green buildings, and sharing best practice through the WorldGBC's Asia Pacific Leadership in Green Building Awards, among other initiatives.

On her appointment, Joelle is excited and enthusiastic: ***"For the green building movement to flourish, we need the entire building and construction value chain - from developers to occupants - to work together. I am excited and delighted to be at the forefront of the Asia-Pacific's green building development, working with Green Building Councils and other like-minded industry organisations to raise our collective profile, deliver impact, and create green buildings for everyone, everywhere."***

The Asia Pacific Regional Network Manager serves as the nexus between regional green building organisations, at the same time providing a direct link to the WorldGBC. Joelle will be based in Singapore and operate out of the Singapore Green Building Council's premises.

For discussions on regional projects and initiatives, you can contact the SGBC Secretariat at enquiry@sgbc.sg or 67325518.

A GREEN HOME FOR AKZONOBEL IN SINGAPORE

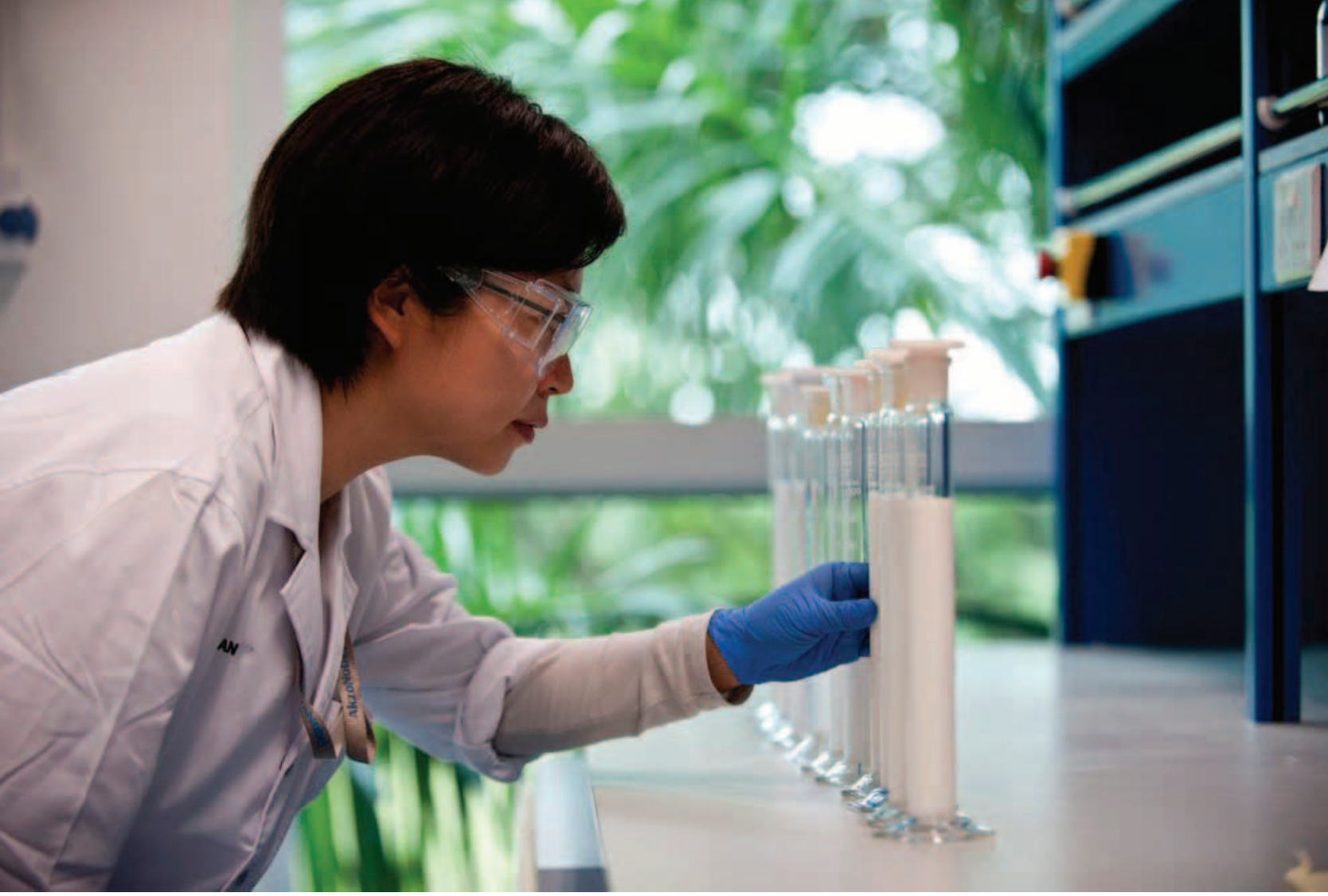
AkzoNobel, the world's leading paints and coatings company and major producer of specialty chemicals, opened its office in Singapore in 2012. Named AkzoNobel House, the office functions as a centralised hub that will support the company's various growth strategies across Asia and beyond. The building houses a number of AkzoNobel businesses and corporate functions, the Global Decorative Paints Exterior Wall Expertise Centre, as well as further Research, Development and Innovation (RD&I) facilities.

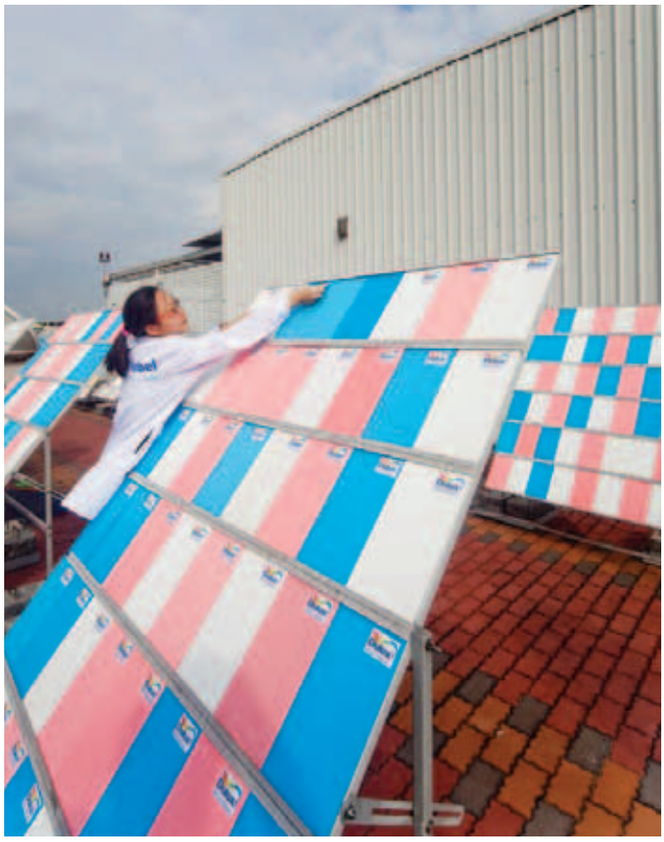
Occupying over 74,000 sq feet and four floors in the Changi Business Park area, AkzoNobel House will be staffed by a team of over 200 personnel. Businesses operating from AkzoNobel House include Automotive & Aerospace Coatings, Decorative Paints, Ethylene and Sulfure Derivatives, Industrial Coatings, Surface Chemistry and various AkzoNobel Corporate functions. AkzoNobel House includes several RD&I laboratories in a single location to support business growth in Asia including driving new product innovation. These laboratories are for the Decorative Paints, Functional Chemicals and Surface Chemistry businesses.

NEW GLOBAL LABORATORY FOCUSES ON DECORATIVE PAINTS FOR EXTERIORS

AkzoNobel House in Singapore also houses the new Global Exterior Wall Expertise Centre for Decorative Paints, which will screen new technologies, support formulation cost optimisation and develop new products for the global market. Exterior Paints market is a major market across Asia and the weather here provide a good testing environment. AkzoNobel


AkzoNobel





House has an open roof that also serves as a test site for these products under local weather conditions. Dulux Weathershield Keep Cool is an example of a popular exterior decorative paint product developed in Asia and now deployed globally.

CONSOLIDATED LABORATORIES TO DRIVE INNOVATION IN SPECIALTY CHEMICALS

AkzoNobel's Specialty Chemicals business area has strong worldwide positions in chemical formulation ingredients for detergents, automotive parts, building materials, plastics, pharmaceuticals and cosmetic.

As part of the Surface Chemistry and Functional Chemicals centres in Singapore, AkzoNobel House houses the Surface Chemistry RD&I Performance Additives Application Laboratories for the Asian region.

AkzoNobel's Performance Additives business has a unique technology base and profound experience in the production of high quality cellulose derivatives, redispersible polymer powders and specialty additives. Based in Singapore, the unit

provides technical support for the Asia region for the company's BERMOCOLL®, BERMODOL® and ELOTEX® product ranges for the paints and building industries.

AKZONOBEL HOUSE – A PLACE OF CHARACTER

While AkzoNobel has a global brand presence in over 80 countries in the world, it has a significant presence in Singapore. Hence, the team at AkzoNobel wanted to give its regional office a strong sense of the Singaporean identity inspired by the local culture, national spices and colours. This is reflected in the unique design of the interiors and the extensive use of colours to demonstrate what colours can do in the work environment when used creatively.

The space has been selected and designed to be conducive for the generation and sharing of ideas among the diversity of people working there from across the world. Work spaces are carefully arranged in such a way that fluidity and communication is encouraged and its people can

work in cozy, amenable spots, complete with natural, familial interactions. The main office floors are inter-connected with an open atrium, so that one experiences the sensation of merging two floors together in unison.

AKZONOBEL HOUSE IS A GREEN MARK BUILDING

As a leading company in sustainable practices, AkzoNobel keeps sustainability at the heart of its corporate strategy. Therefore sustainability was also at the top of the company's agenda when selecting a new site in Singapore. AkzoNobel House has been awarded the Building and Construction Authority (BCA) Green Mark GoldPLUS standard, a building rating system to evaluate a building for its environmental impact and performance.

Besides using eco-certified decorative paints, the building has a consolidated recycling system, as well as procedures such as the Water and Energy Efficiency Improvement Plans which monitor carbon and resources consumption every month and encourage pro-active moves to ever more sustainable behaviour.

The company believes that the investment in AkzoNobel House in Singapore in an important step in AkzoNobel's ongoing expansion and development in Asia, a recognition of how future innovation and development will increasingly flow from Asia back to the rest of the world, and a confirmation of Singapore as an important part of that strategy.

Images courtesy of AkzoNobel.

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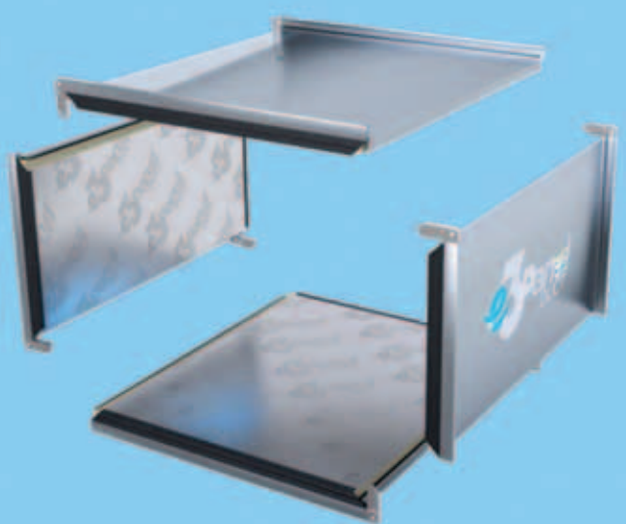

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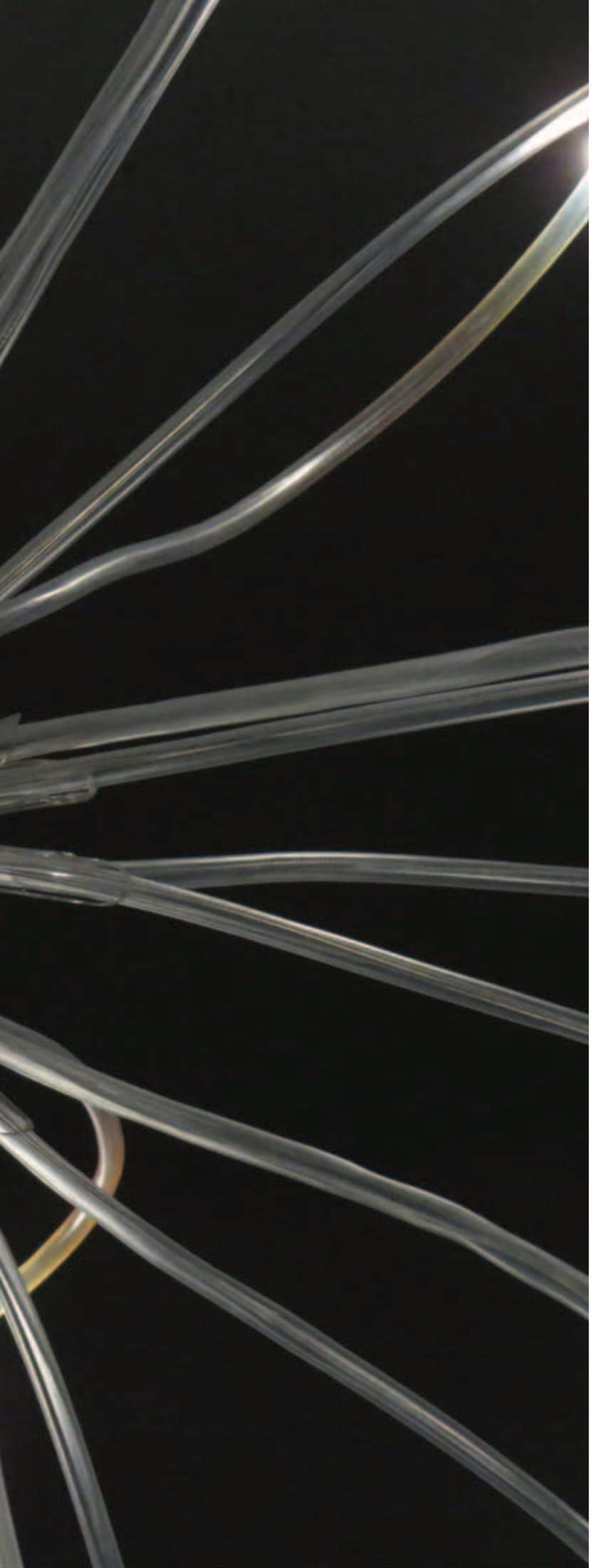
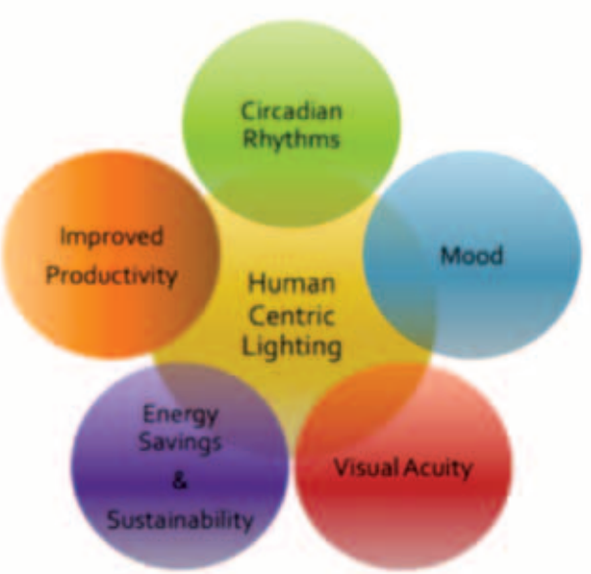
LIGHTING FOR WELLNESS



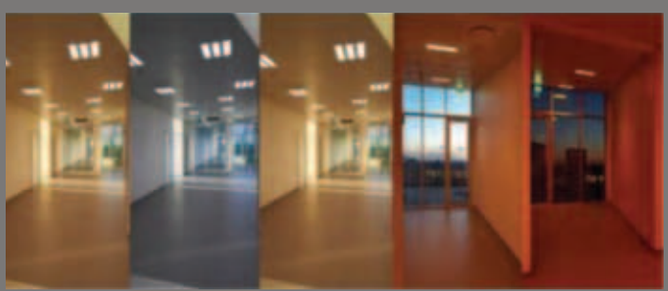
Technology in the lighting industry has progressed tremendously over the past eight years. From traditional incandescent lighting to light emitting diodes (LED), many lighting manufacturers faced a huge challenge they had never encountered – electronics. In the face of this tribulation, many companies frantically jumped onto the LED bandwagon using standard LED modules produced by LED chip manufacturers or LED driver manufacturers out of fear that they would be ousted by their competitors. This resulted in the failure of many lighting manufacturers during the conversion process due to the loss of their unique brand identity.

It has not been long since LED technology stabilised, but now, a second evolution is taking place. Smart lighting is the next generation of lighting. As LED lightings are electronics-based, they give rise to opportunities where wireless control and sensor integration can add value to existing LED lighting. These new integrated LED lightings are what we call smart lighting.

As lighting becomes more functional than just providing light, humans are exploring ways where light becomes an interactive component in our daily lifestyle.



Human-centric lighting is a term or expression used where lighting is intended to promote a person's well-being, mood and health. Energy savings and sustainability are just the basic benefits LED lighting can provide by virtue of their lower energy consumption and longevity compared to incandescent lighting.



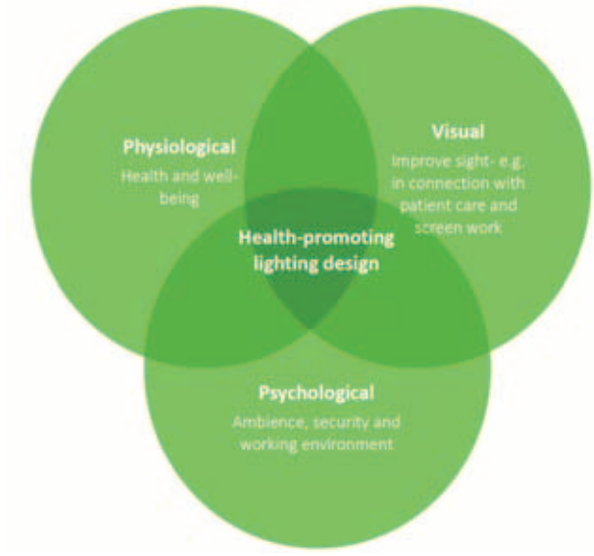
Founded in year 2015 as a new technology and manufacturing venture, Photizo Global integrates the most advanced technologies to develop smart lighting solutions. Its innovations in the field of lighting technology focus on people and their needs – Human-Centric Lighting. Development is concentrated on digitalisation, intelligent building networks, safety, security and the impacts of light on humans.

One key project currently underway is a pilot study conducted with the Singapore Green Building Council (SGBC) and the Singapore Institute of Technology (SIT) in The Salvation Army's Peacehaven Nursing Home.

In this study, health-promoting lighting which follow the circadian rhythm of human beings is installed in the wards housing residents with dementia. In its simplest terms, a circadian rhythm is the body's clock: a cycle telling the body when to awake, eat, sleep and regulates many physiological processes. This rhythm can be affected by environmental factors such as sunlight and temperature, and may affect eating and sleeping patterns if the rhythm is disrupted. Research have also looked into the potential adverse effects a disordered circadian rhythm can have on the human body, for example increasing the risk of major circulatory ailments, obesity, depression and bipolar disorder. Therefore, this area of human health is worth looking into.

The health-promoting lighting design installed in Peacehaven Nursing Home combines physiological, visual and psychological elements to elicit positive impact on the occupants.

All of the installed lights are controlled wirelessly, enabling the staff to easily adjust each individual lighting point on top of a fixed lighting schedule. This is less disruptive to the room occupants as the staff do not need to switch on all the lights while attending to one particular resident in the middle of the night. Additionally, a simple touch on the smart device will bring that particular light to the required brightness level without disturbing the rest of the other residents.



At night, lights with warmer colours and dimmed lighting enable residents to sleep better while still ensuring adequate visibility for the work efficacy of the nursing home's staff.

The lighting system also helps to ensure the safety of the residents. Coupled with special sensors that are able to detect abnormal movements of the residents, necessary lights will be automatically switched on in the event of an emergency or when the residents make their way to the washroom themselves in the middle of the night.

With this circadian health-promoting lighting installed, the residents will have improved sleeping cycles and will be able to experience natural fatigue when night falls. They will also feel less agitated and frustration, leading to more appropriate behaviour. The staff on the other hand will be more cheerful and energetic in the day due to improved sleep after night duty. They also tend to be more gentle and considerate to the residents due to the dimmed and lower coloured temperature environment.

The aim of this pilot study is to come up with standard guidelines for effective lighting design in the health sector. By creating such optimal health-promoting lighting system, a major difference can be made to patients and staff.

The results of the pilot study will be made available in due course.

Images courtesy of Photizo Global.

SCHÜCO:
INDIVIDUAL DESIGN, MAXIMUM ENERGY EFFICIENCY AND ECONOMICAL CONSTRUCTION

Green Building - Schüco Italia srl Headquarter, Padova, Italy

360° cycle of sustainability for Schüco and its partners

360° SUSTAINABILITY – FROM IDEA TO REALITY

In the construction sector, sustainability means designing, constructing and operating a property in such a way that it is ecologically, economically and socio culturally future-proof. This requires high-quality, innovative products and solutions which conserve resources. As a driving force behind innovation, Schüco offers concepts and product solutions with the best possible support for investors, architects, building consultants and metal fabricators in all phases of a project. In practice, this means support including advice and designs with sustainable systems and environmental product declarations through to the demolition and recycling of the building envelope.

A FOCUS ON ENERGY EFFICIENCY AND CONSERVING RESOURCES

Increasing energy costs, new building specifications as well as a shift in awareness towards a strategy of sustainability are changing the market for energy-efficient construction worldwide. Highly efficient window, door and façade systems, combined with flexible design, versatile functions and intelligent networking, are a key factor for the building envelopes of the future.

A TECHNOLOGICAL LEADER FOR SUSTAINABLE BUILDINGS

Together with its worldwide network of partners, architects, specifiers and investors, Schüco creates sustainable building envelopes that focus on

From left Matthijs Bruijnse, SVP – International 1 – Schüco International KG, Andreas Engelhardt – Managing Partner and CEO - Schüco International KG and Benedikt Herweg, Managing Director - Schüco Southeast Asia

people and their needs in harmony with nature and technology. Aluminium windows, doors and façade solutions from Schüco meet the highest requirements in terms of design, comfort and security. At the same time, CO2 emissions are reduced through energy efficiency, thereby conserving natural resources.

The company delivers tailored products for new buildings and renovations, designed to meet individual user needs in all climate zones. Everyone involved is supported with a comprehensive range of services at every stage of the construction process. With 4,630 employees and 12,000 partner companies, Schüco is active in more than 80 countries and achieved a turnover of 1.43 billion euros in 2015.

DEEPENING KNOWLEDGE IN SOUTHEAST ASIA

Indeed, during the first ever Southeast Asian Zak World of Façades event that was held in Singapore in October 2016, Schüco demonstrated their commitment to sustainability and green buildings. As an inaugural event, the conference was important as it gathered all the key players of building and construction into one location to have quality discussions on the future of façades.

The participants of the conference agreed that there is a rising need to develop buildings and façades in the region that not only fulfil the requirements of form and function, but there is also a need to educate and inform the region around the importance pertaining to the sustainability of buildings as well.

Group photo together with ZAK Group organizers, conference speakers and panelists

Green Building - Siemens City, Vienna, Austria

A COMBINATION OF SUSTAINABILITY AND ENERGY EFFICIENCY

In Asia, thermal insulation will become a decisive factor in the energy revolution. Many local authorities have already pledged to implement thermal insulation standards when constructing new public buildings. Schüco's large product portfolio can meet all regulations and requirements for energy efficiency standards.

At the high-end of the product range, are the Schüco Window System AWS 90.SI+ Green and the Schüco Façade System FW 50+.SI Green that even fulfil the Passive House standard sustainable buildings. Both constructions combine the advantages of durable aluminium with thermal insulation to Passive House standard, thereby conserving natural resources and reducing CO2 emissions. Equipped with plastics containing a significant proportion of renewable raw materials, these windows and façades now make a double contribution to the reduction of greenhouse gases, since they have a lower potential for

Green Building - Statoil Headquarters, Fornebu, Norway

Singapore Green Building Product Certification

global warming. This means that using renewable raw materials releases fewer greenhouse gases into the atmosphere during manufacturing and it also conserves natural resources. By integrating renewable raw materials into aluminium windows and façades with thermal insulation to passive house standard, Schüco is demonstrating its commitment to energy-efficient and sustainable construction.

A COMMITMENT TO RESEARCH AND DEVELOPMENT

Schüco develops and tests products in its own accredited Technology Center. With an area of 7,800m2 and the largest indoor façade test rig in Europe, it is one of the leading test centres for windows, doors and façades. Right from the start of product development, this allows Schüco to fabricate, test, continually improve and validate new systems, individual components or special solutions. At the same time, the Schüco Technology Center is the ideal platform for training specialists and engineers.

TAKING RESPONSIBILITY LOCALLY

As a company, Schüco is aware that its economic activities have effects on the environment and that it therefore has an obligation to nature and to succeeding generations in terms of resources and environmentally-friendly trade. This means that not only do the Schüco systems underlie the basic principles of sustainable product development, but the employees also make a contribution to minimising the impact on the environment through their responsible day-to-day actions.

In December 2016, Schüco has been awarded with the Singapore Green Building Product certification for window and façade systems from the Singapore Green Building Council. Schüco aimed to be in the vital role that provides maximum values for architects and property developers to meet their sustainability targets for buildings in Southeast Asia region.

AN ONUS ON HIGH-TECH PRODUCTS

People in industrialised nations spend the majority of their lives in buildings, which makes it all the


SCHÜCO

Schüco Technology Center, Bielefeld, Germany

more important that buildings are well designed, convenient and secure.

Energy-efficient, automated building envelopes meet these requirements. Windows, doors and façades from Schüco are high-tech products which are used in every climate zone and all building types. If required, they can provide burglar and fire resistance and offer sound reduction, as well as withstand heavy gunfire. The technology behind them cannot be seen, but is very effective and durable.

The automatically-controlled building envelope is a topic with a great future.

Numerous functions such as ventilation, regulating room climate, shading, security and generating energy must be combined to optimise energy consumption. This is achieved with automatic opening and closing systems for windows that control natural ventilation cycles, as well as daylight and sunlight-dependent shading systems, which ideally are coupled with internal lighting, heating and climate control. Centrally controlled windows and doors can be used, on the one hand, to generate energy and, on the other hand, to ventilate the building at night via controlled opening of windows.

Schüco aims to have all active elements in a building envelope be networked electronically and controlled automatically. This allows for the full energy efficiency potential of the building envelope to be exploited. The radio-controlled Wireless Control System (WCS) allows for automation without the need for cabling, making it suitable for building modernisation. Using communication modules such

as iPad, iPhone, Android etc., as a means of control opens up new possibilities for operation, setting and use of opening units such as solar shading, anti-glare protection, light control and climate regulation.

TOWARDS THE FUTURE

As a newer player to the Southeast Asian market, Schüco is poised to extend its reach in the region following the establishment of the necessary infrastructure. The company is looking to provide every and any assistance to key industry players within the region, such as supporting events like Zak World of Façades, in order to create a harmonized setting to share experiences and expertise with the greater industry.

Schüco is also looking to strengthen and establish the foundation of good and sustainable approaches to construction and design as buildings do not impact our lives in the short term, but rather accompany us for decades. This is why the importance of sustainable and energy efficient designs and buildings is of utmost importance and has always been the mantra of the company. Schüco will continue to aid, share and develop sustainable projects within the region with both current and future solutions that have yet to be discovered. This approach will always be the backbone of Schüco as the world heads towards a sustainable tomorrow.

For more information, visit www.schueco.com

Images courtesy of Schüco International KG.

PAINT IS SO MUCH MORE THAN PRETTY COLOURS

If you thought paint was little more than makeup for walls, think again. Today's modern paints perform a variety of pragmatic as well as aesthetic functions, from culling mosquitoes to inhibiting the spread of viruses and lowering the indoor temperatures of buildings.

PUTTING PEOPLE FIRST

More than a decade ago, Nippon Paint was the first paint brand in Singapore to release odour-less paints. Historical data had established a link between long-term exposure to conventional paint products and a long list of health concerns ranging from minor complaints such as headaches and nausea to serious and life-threatening conditions including lung disease and certain forms of cancer. The culprit was the Volatile Organic Compounds, aka VOCs, responsible for the ubiquitous 'new paint smell' of a surface painted with traditionally formulated paint.

Thanks to heavy investment in long-running advertising campaigns for odour-less paints, the Singaporean public soon wised up to the perils of paint odour. Inevitably, demand increased and other paint brands followed. Today, almost all paints marketed for consumers emit low odour or near-zero odour. With rising rates of asthma and allergic rhinitis, this is a healthy development for both the paint industry and the public.


YCH

WHAT A CAN OF PAINT CAN DO

Nippon Paint has paved the way by not just eliminating harmful ingredients from its paints, but by adding helpful ones. Popular Nippon Paint 3-in-1 Medifresh is a perfect example. Specially formulated with anti-bacterial agents, this long-established interior paint inhibits asthma, flu and diarrhoea among other common bacterial infections. It is especially recommended for households that include the very young and the elderly – at-risk age groups with low immunity.

More recently, Nippon Paint developed a functional paint known as Nippon Paint VirusGuard, which directly addressed the public alarm raised by outbreaks of Hand Foot and Mouth Disease (HFMD) in local kindergartens and preschool centres. Its anti-viral properties effectively reduce the risk of HFMD as well as other common viral and bacterial infections such as E.Coli, a common strain of food poisoning. It is widely used in early childhood educational institutions, hospitals and other healthcare providers.

TAKING THE STING OUT OF DENGUE

The latest in a long line of functional paint products developed by Nippon Paint in response to consumer needs, MozzieGuard contains a powerful, certified safe-for-humans active ingredient that is lethal for mosquitoes. It addresses public concern over the increased incidence of diseases spread by mosquitoes, namely dengue fever and more recently, the outbreak of the Zika virus.

Nippon Paint MozzieGuard leverages on the little known fact that mosquitoes are behaviourally programmed to look for a vertical landing pad on entering an enclosed space – in other words, a wall. Upon contact with mosquitoes, the active ingredient within the paint is released, and enters the nervous system of the insect within seconds. The result is certain fatality.

This outcome is far preferable to other forms of pest control which merely repel mosquitoes, relocating them to other areas where they can continue breeding and spreading the misery of potentially

deadly diseases. Beyond protecting the occupants of private properties, MozzieGuard indirectly performs a public service for the community by reducing the mosquito population.

TAKING THE HEAT OFF BUILDINGS, AND THE PLANET

In addition to disease prevention, paint can also help fight global warming. Heat-resistant paint technology is actually fully developed and readily available.

An exterior paint, Nippon Paint's SolaReflect contains infrared light-reflective pigments that reflect the near infrared rays of the sun away from the coated surface of a building before it can be absorbed and generated as heat. Consequently, less heat is produced, improving occupant comfort and reducing dependency on air conditioning. This in turn leads to significant savings on power bills and lowered carbon emissions, which is good news for our planet's seriously depleted ozone layer and helps curb the urban heat island effect.

Apart from reducing the carbon footprint of building owners and improving the comfort of a building's occupants, SolaReflect opens up new possibilities in colour. Traditionally, the architecture of warm climates has been confined to white and light-coloured paints, due to the reflectivity of lighter colours versus the tendency of darker colours to absorb heat. SolaReflect liberates architects and homeowners by opening up a whole new palette for 'cool paints'. The landscape is enlivened as the planet is spared.

PAINTS THAT MIND, NOT MINE, THE ENVIRONMENT

Today's paints can mimic the natural textures of minerals, woodgrain and metals. Special effects paints can bring the lustre of marble, granite, brushed metal and other sought-after materials into homes. Not only do they cost a fraction of the price of 'the real thing', their carbon footprint is miniscule compared to the environmental toll of relentless mining and quarrying, freighting, cutting and polishing.

A homage to the beauty of nature, nature-inspired paints spare our diminishing natural reserves as they protect and beautify indoor environments for the pleasure of people.

PAINT THE POSSIBILITIES…

Paints provide endless possibilities for people. No longer are they just coatings. They silently safeguard the occupants of homes and buildings from airborne diseases. They reflect heat away from buildings to make people comfortable, physically and financially. In a myriad of ways, they protect not just walls and surfaces, but the environment.

Who knows what ingenuous functions paints will one day provide… As companies like Nippon Paint invest heavily in research and development to create paint products that help solve local and global problems, people can look forward to lifting the lid on a world of possibilities that extend far beyond every colour in the rainbow.

Images courtesy of NIPPON PAINT.

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A GREEN SOLUTION TO AIR POLLUTION

As the human population continues to grow, the toll this exacts on our atmosphere can be taxing. With the need for more heavy industry and other necessary machinery to maintain our current way of life, air pollution has also become part and parcel of our daily lives. In Singapore, our air quality is generally within acceptable standards, barring periods when the annual haze creeps in and engulfs the island in a grayish smog for months on end.

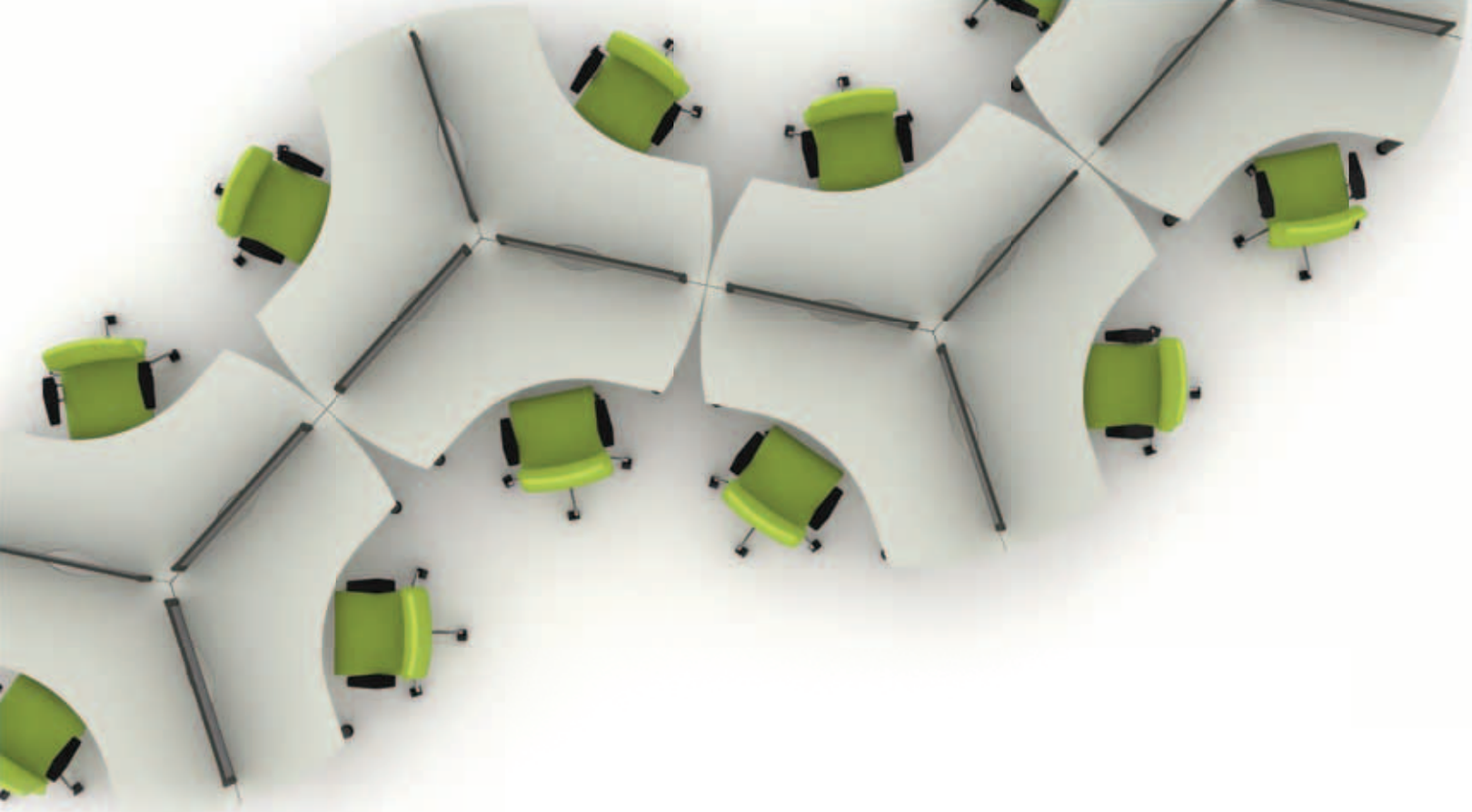
URBAN AIR QUALITY

Despite increased health awareness, the importance and impact of air quality on our health are still often overlooked.

As stated by the World Health Organization (WHO), air pollution – both indoor and outdoor - causes an astounding amount of premature deaths: varying between 5.5 million and 7 million people every year, making it more deadly than HIV, traffic accidents and diabetes combined.

According to Dr Carlos Dora, WHO Coordinator for Public Health, Environmental and Social Determinants of Health, "Excessive air pollution is often a by-product of unsustainable policies in sectors such as transport, energy, waste management and industry. In most cases, healthier strategies will also be more economical in the long term due to health-care cost savings as well as climate gains." Therefore, it stands to reason that having a cleaner air quality can at once generate substantial environmental and economic benefits.

In the workplace, if the indoor air quality is favourable, employee absenteeism levels will fall due to lesser instances of taking ill, leading to a more productive, healthy workforce. Indeed, indoor air quality is a major tenet of the Better Places for People initiative started by the World Green Building Council, with an emphasis on creating healthier spaces for occupant wellbeing.



SO WHAT CAUSES AIR POLLUTION?

VOCs are volatile organic compounds generated by common items that surround us everyday such as copiers, printers, correction fluids, carbonless copy paper and many more. Odourless, its presence often go unnoticed while having an alarming adverse impact on our health.

THE EFFECTS OF VOCS INCLUDE:

- Eye, nose and throat irritation
- Headache, loss of coordination and nausea
- Damage to liver, kidney and central nervous system
- Some VOCs are suspected or known to cause cancer in humans

PLANTS' IMPACT ON AIR QUALITY

Based on studies conducted by NASA, the right plants can soak up harmful particles and release fresh oxygen, while adding a decorative touch. They are able to metabolize toxic chemicals, releasing harmless by-products, and incorporate toxicants such as heavy metals into plant tissues, thus sequestering them. Additionally, indoor plants will alter the moisture content of the air, which must be regulated so as not to promote mold growth. Some people may have allergies to certain airborne pollutants and moisture and when not effectively mitigated by plants, can exacerbate problems for building occupants.

COMMON TYPES OF VOCS:

PLANTS BENEFICIAL TO INDOOR AIR QUALITY

ENGLISH IVY

- Removes Benzene and Formaldehyde
- Fantastic for asthma and allergies

CHINESE EVERGREEN

- Removes Benzene and Formaldehyde
- Emits high oxygen content

BOSTON FERN

- Removes Formaldehyde
- Natural air humidifier
- Said to be among the best in air purifying houseplants

GOLDEN POTHOS

- Removes formaldehyde and Carbon Monoxide
- Increases general indoor air quality

PLANTS BENEFICIAL TO INDOOR AIR QUALITY

PEACE LILY

- Removes Benzene, Formaldehyde, Mold spores, Trichloroethylene, Alcohols and Acetone
- Increases general indoor air quality

SPIDER PLANT

- Removes Formaldehyde, Carbon monoxide, Toxins and impurities
- One of the top three types of houseplants that are great at removing Formaldehyde

WARNECKII

- Removes Benzene and Trichloroethylene
- Increases general indoor air quality

PHILODENDRON

- Removes higher concentration of Formaldehyde
- Increases general indoor air quality

Courtesy of Chop Ching Hin Pte Ltd.

A LIVING FILTER

Chop Ching Hin has been working with plants for the better part of over 40 years, striving to integrate the benefits of greenery into modern society. Through knowledge and extensive research, the GWS Living Filter was developed to help bring forest air into our buildings and the GWS air filter is specially designed by professionals to combat the different community.

As a HVAC (Heating, ventilation and air conditioning) system integrated with green elements to create dynamic air flow, this innovative filter is a fusion of nature (plants) with technology to generate cleaner air with elevated effectiveness and efficiency in terms of reducing VOC levels. Exquisitely made up of over 40 different types of plants, the filter is able to reduce the levels of most types of VOCs in the air.

The intricate fusion of plants and technology allows the GWS Living filter to achieve all rounded efficiency acting as both air and VOCs purifier, while integrating the benefits of greenery into the environment. It is a system that is skillfully crafted to embody various types of benefits in one, rendering solutions to modern problems while bringing green to higher levels.

MOULD IN THE WORKPLACE

Indoor air quality is an important part of our daily life as we spend most of our time indoors, whether to live, work or play. This is especially pertinent in hot and humid Singapore, where air conditioning and mechanical ventilation (ACMV) systems are heavily used to provide thermal comfort in indoor environments. The potential for indoor air contamination increases in such sealed indoor environments, and airborne micro-organisms and substances such as mould are able to do significant damage to buildings and quality of life.

Mould exposure can have serious health consequences. Concerns about indoor exposure to mould has increased along with improved public awareness about the health effects of mould on human health, including allergic reactions. This article hopes to provide some basic understanding of what mould is, how mould affects people and what can we do to prevent and get rid of mould.

WHAT IS MOULD?

Mould is a fungus that can be found both indoors and outdoors. No one knows how many species of fungi exist but estimates range from the tens of thousands to perhaps three hundred thousand or more. Mould grows best in warm, damp and humid conditions, spreading and reproducing by the dissemination of spores. Mould spores are hardy enough to survive harsh environmental conditions, such as dry places.

WHERE CAN MOULD BE FOUND?

Mould is part of the natural environment and it can be found anywhere - inside or outside - throughout the year. In the outdoors, mould plays an important role in nature by breaking down organic matter such as toppled trees, fallen leaves, and dead animals. Without mould, we would not have food and medicines, like cheese and penicillin.

However, in indoor environments, mould growth should be avoided. Problems may arise when mould starts eating away at materials. Mould can grow on virtually any substance, as long as moisture, oxygen and an organic source are present. Mould reproduce by creating tiny spores (viable seeds) that usually cannot be seen without magnification. Mould spores continually float through the indoor and outdoor air environment.

When excessive moisture or water accumulates indoors, mould growth often occurs, particularly if the moisture problem remains uncorrected. While it is impossible to eliminate all mould and mould

spores, controlling moisture can control indoor mould growth.

Since mould requires water to grow, it is important to prevent excessive moisture in buildings.

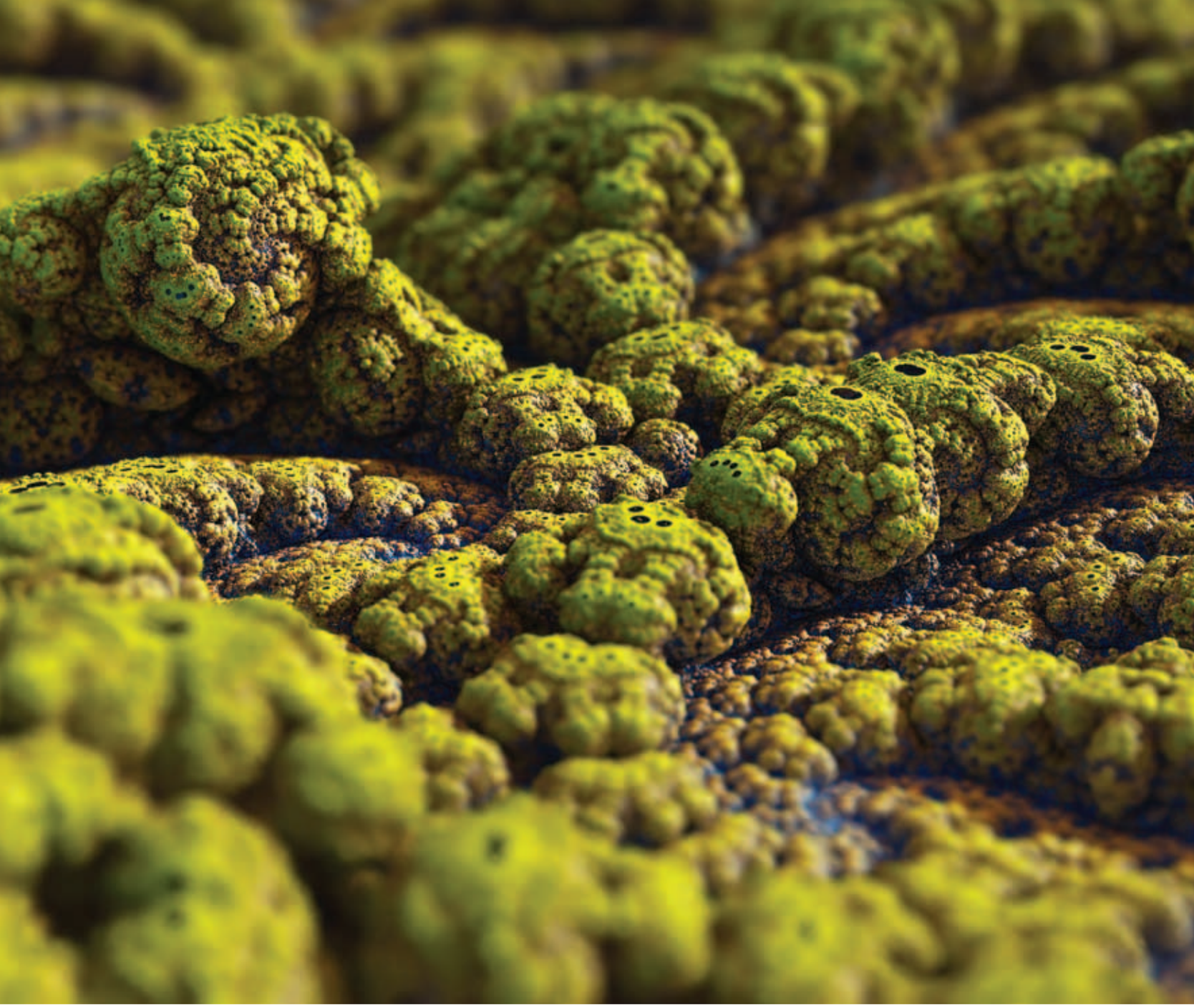
HOW DO MOULD AFFECT PEOPLE?

Some people are highly sensitive to mould. For these people, exposure to mould can cause health symptoms such as nasal stuffiness, eye irritation, wheezing, or skin irritation. Some people, such as those with serious allergies to mould, may have more severe reactions. Such severe reactions may include fever and shortness of breath, and these may occur among workers exposed to large amounts of mould in occupational settings. People with chronic lung illnesses, such as obstructive lung disease, may even develop mould infections in their lungs. All these ailments can be detrimental to the human health and can be potentially lethal if left unchecked.

PREVENTION

If you suspect mould building up in your workplace, ask yourself these questions:

- Is there visible water damage anywhere?
- Are there building materials around that have been wet for more than two days?
- Does the building have pre-existing moisture issues?



- Are workers complaining of musty or mouldy smells?
- Is anyone reporting health problems that could be associated with mould?

The Occupation Safety and Health Administration (OSHA) recommends a number of tips to help prevent mould in your workplace, including:

- Repair any plumbing problems immediately
- Keep your building's humidity level to below 70 percent
- Regularly inspect your building's HVAC system
- Ensure adequate drainage around your building
- Keep vents for moisture-creating appliances on the outside of the building

For more details on how to remove and prevent mould build-up indoors, you can refer to the following resources:

https://www.osha.gov/dts/shib/shib101003.html

https://www.wshc.sg/files/wshc/upload/infostop/attachments/2016/IS20160322000000396/WSH_Guidelines_on_Management_of_IAQ.pdf

http://www.aeris.com.au/coil-cleaning/

PUT WELLBEING AT THE HEART OF YOUR BUILDING.

BETTER PLACES FOR PEOPLE



KEY ACTIVITES

- Outreach to tenants through owners, investors, real estate managers and more!
- Providing tenants with the knowledge and means of creating greener spaces and offices.
- Creating a database of information on tenant expectations and concerns, to better understand changing trends and needs.

WHY "BETTER PLACES FOR PEOPLE"?

Research shows that a building's design impacts the health, wellbeing and productivity of its occupants.

The World Green Building Council's 2014 global report *Health, Wellbeing and Productivity in Offices* raised awareness of this issue by outlining the evidence linking office design with occupants' health and productivity. The same features commonly associated with green buildings have a measurable impact on human wellbeing. This strengthens the ongoing business case for energy-efficient, resource efficient, healthier buildings.

Better Places for People builds upon the foundation provided by the report.

WHAT ARE OUR AIMS AND ACTIVITIES?

Better Places for People aims to accelerate the demand and supply of buildings that support people in living healthier, happier lives by raising awareness of how buildings impact people, and by presenting the business case for action.

SGBC, BCA and our Programme Partners - owners, investors and real estate managers, will engage and collaborate with tenants through a range of activities to help drive action on the ground.

Get Involved in the Campaign!

Singapore Green Building Council (SGBC)

CONTACT:
outreach@sgbc.sg
TEL: 6732 5518

WORLD GREEN BUILDING COUNCIL

SINGAPORE GREEN BUILDING COUNCIL

BCA

SINGAPORE GREEN BUILDING PRODUCT SGBC

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SINGAPORE GREEN BUILDING PRODUCT LABELLING SCHEME

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Key Features of the SGBP

- A holistic and comprehensive approach to green building product rating
- Relevant assessment criteria drafted for the industry, by the industry
- Recognised by the BCA Green Mark Scheme
- Accredited under Singapore Accreditation Council to ISO/EC 17065 Requirements
- Adheres to ISO 14024 Type I Environmental Labelling Programme requirements
- Supported by SPRING Singapore Capability Development Grant

Benefit of Certification

- Credible snapshot of product's environmental performance
- Greater awareness of your green building product
- Industry recognition
- Enhanced access to global markets

Comprehensive Assessment Criteria

Energy Efficiency

Water Efficiency

Resources Efficiency

Health & Environmental Protection

Other Green Features

SINGAPORE GREEN BUILDING COUNCIL

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GET TO KNOW GREEN BUSINESS PROFESSIONALS

Establish connections with green building leaders, advocates and practitioners in both local and international industries.

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STAY UPDATED ON THE LATEST

Get access to the latest within green building and sustainability: new knowledge and technology, trends, engineering and more.

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Use your membership influence to set the direction for green building practices.

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Enjoy the use of the SGBC corporate logo for your business cards and corporate stationery.

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Contact SGBC today and let us discuss how we can help to give your business an advantage with our corporate membership and green certification.

Don't ask what you can do for 'green'. Ask what going green can actually do for your business.

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