

November 2021

# Healthy Residential Buildings in China

Building in health to  
advance building wellbeing





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# EXECUTIVE SUMMARY

Generally around the world, as much as 60% of our time is expended at home during the day and that's not even making an allowance for the one-third of our time devoted to sleeping at night. With this amount of time spent residing at home, it is not surprising that people are progressively becoming concerned about how healthy their living accommodation is.

Levels of pollution within buildings in many locations globally, including in some residential buildings, are frequently greater than levels recorded outside. In many situations, evaluations done to assess indoor levels of radon,

environmental tobacco smoke (ETS), and lead have substantiated that health and safety risks are significant. Not only this, thousands of chemical and biological pollutants can be found to be present indoors, many of which are known to have a considerable health impact on people.

When looking to improve residential building health, there are many ways this can be accomplished, but nine principal areas that can be observed, addressed and improved upon are:

- Air conditioning and ventilation;
- Air quality;
- Temperature and humidity;
- Damp and fungus;
- Dust, grime and pests;
- Water quality;
- Noise pollution;
- Lighting and views, and;
- Safety and security.

For the purposes of this report, to be classified as a certified healthy residential building, a property has to satisfy certain conditions:

- 1 Evidence of a healthy building certification, and/or;
- 2 Has integrated a healthy building-related standard/scheme/technology.

As for fulfilling the first condition, investors, developers and owners in China have a number of healthy building certification choices open to them. One example, however, is the International WELL Building Institute (IWBI) and their WELL Building Standard version 2 (WELL v2) certification.

As for fulfilling the second condition, again, there are a number of healthy building-related standards, schemes and/or technology which can be integrated in China by investors, developers and owners. Regarding standards, one example is the domestically generated Evaluation Standard for Healthy Housing (T/CECS 462-2017).

In brief, both WELL v2 and the Evaluation Standard for Healthy Housing (T/CECS 462-2017) provide comprehensive building appraisal schemes that can augment human health and wellbeing throughout the residential built environment.

When clearly centring on healthy residential projects, and in particular, certified residential projects built by a representative group of 10 selected major developers, some years prior to 2017, healthy residential housing building volume in China was comparatively small. Over the eight-year period between 2008 and 2016, the average accumulated supply growth rate for this asset class was 25.8%. On the other hand, over recent years, the accumulated residential supply with “health” as a major theme has grown significantly. Over the four-year period, between 2017 and 2020, the average growth rate for

accumulated healthy residential project supply, built by this group of selected developers, grew by a considerable 58.8%. Ahead, once mindfulness of the benefits of living in healthy residential housing is higher among more of the general public, so we anticipate the supply volume of healthy residential housing in China to further inflate in the years to come.

Knowledge of the importance of living in a healthy residential dwelling is increasing in China. Nearly a decade back, as affirmed by a market survey by Fang.com on the awareness of healthy housing, it can be seen that only about 24% of consumer respondents were acquainted with the notion of healthy housing. Moreover, as per a recent survey by Baixing Finance & Economics, over 70% of respondents plan to improve their living environment and the health level of their home by either modifying their existing home, buying a new house or renting a better one.

As the health of residential buildings in China is further enhanced, a healthy residential housing system can also be created and employed by developers and asset owners.

Lastly, from the adoption of such a healthy residential housing system, a greater amount of certified healthy residential homes, which integrate healthy design, materials, products and technology, can be realised in China.

# INTRODUCTION

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This report begins by focusing on the importance of healthy residential buildings, before looking at the healthy residential housing market in China.

Consumer sentiment in China is then examined, and after this, the report highlights two healthy residential housing projects; one international – 21W20 Flatiron in New York City; and one domestic – Landsea Yue Mansion in Hangzhou.

Moving on from here, the report touches on an outlook for the health of residential buildings in China, including the listing of some market goals.

Finally, the report finishes off with an example of an optimal healthy residential building scheme and an example of an optimal healthy residential home.

# THE IMPORTANCE OF HEALTHY RESIDENTIAL BUILDINGS

People spend a lot of time at home. On average around the globe, as much as 60% of our time is spent at home during the day and that's not even considering the one-third of our time spent sleeping at night. With this amount of time spent residing at home, it is not surprising that people are increasingly becoming concerned about how healthy their living accommodation is. Today, this concern is evident so much so that a recent survey of 3,000 homeowners in the UK by the UK Green Building Council reported that at least 30% of those surveyed would be willing to pay more for a property that had a positive effect on their overall health, and, if renting, this could be as much as a 20% premium on the rental.

Levels of pollution within buildings in many locations globally, including in some residential buildings, are often higher than levels recorded outside. In many circumstances, assessments done to examine indoor levels of radon, environmental tobacco smoke (ETS), and lead have proved that health and safety risks are considerable. Not only this, thousands of chemical and biological pollutants can be found to be present indoors, many of which are known to have a substantial health impact on people.

Contact with radon, ETS, lead, and other toxins within the home can bring about a variety of health issues. Below are some causal health issues of highest concern:

## ***Procreative and growth defects***

Raised blood lead levels are related to a number of developmental delays, including decreased growth, stature and intelligence quotient. Some studies show that general indoor pollutants (including lead and ETS) can also harm foetal growth. Endocrine disruptors, for instance pesticides and plasticisers, which can have an effect on specific hormones, are also a concern. Exposure before conception in either parent, while pregnant, or after delivery can affect a child in a number of ways from being underweight to having genetic abnormalities to having a lower IQ.

## ***Asthma***

With a large and increasing number of people around the globe suffering from asthma, the social and economic costs are immense. One of the main effects of asthma is absenteeism, whether it is from school or work. Absenteeism impinges on learning and productivity, respectively. Studies have shown that ETS, dust mites and other indoor-related allergens are triggers for asthma.

## Cancer

Indoor pollutants, such as radon, asbestos, ETS and benzene, have been proven to be carcinogenic. Other pollutants, such as polycyclic aromatic hydrocarbons, some chlorinated solvents, aldehydes, and pesticides have been identified as a cause of cancer in humans. The National Academy

of Sciences (NAS 1998), determined that radon was the second foremost cause of lung cancer in the U.S. when their report was published. What's more, leukaemia, bladder cancer and other forms of cancer have also been associated with indoor air pollutants.

## Additional health outcomes

Indoor settings can instigate or magnify a number of other health issues as well. ETS is known to be a source for cardiovascular disease. Carbon monoxide poisoning from faulty heaters, stoves or wood burners is associated with hospital admissions or even death in some cases. Also, the agent for Legionnaires' disease is connected with air conditioning systems, whirlpools, humidifiers and even tap water. Finally, effects related to certain fungi and bacteria can span mild skin irritation to immunosuppression and cancer.

Ultimately, many of the indoor contaminants and pollutants that cause health issues in people, including the health issues outlined above, can fall under the sick building syndrome (SBS) label. The term "sick building syndrome" was first used in the 1970s, and depicts a range of specific and non-specific ailments registered by building occupants. While ailments can also be associated with activity outside of buildings, often SBS ailments are related with use of and residence of buildings and in this case, the use of and residence of residential buildings.

When looking to improve residential building health, there are many ways this can be achieved, but nine focal areas that can be monitored, addressed and improved upon are outlined in Figure 1:

Figure 1: Nine foundations for a healthy residential building



Source: *archdaily.com*, Cushman & Wakefield Research

## ***Air conditioning and ventilation***

A properly working overall residential building air conditioning and ventilation system is a key component to mitigating some of the health issues that might arise within the property. To ensure proper mitigation, outdoor air ventilation rate directives should be matched or surpassed. All related systems should be regularly deep cleaned and recirculated and outdoor air should be filtered and purified so that even nanoparticles are effectively eradicated. Additionally, outdoor air intakes should be placed away from street-level pollutant sources.

## ***Air quality***

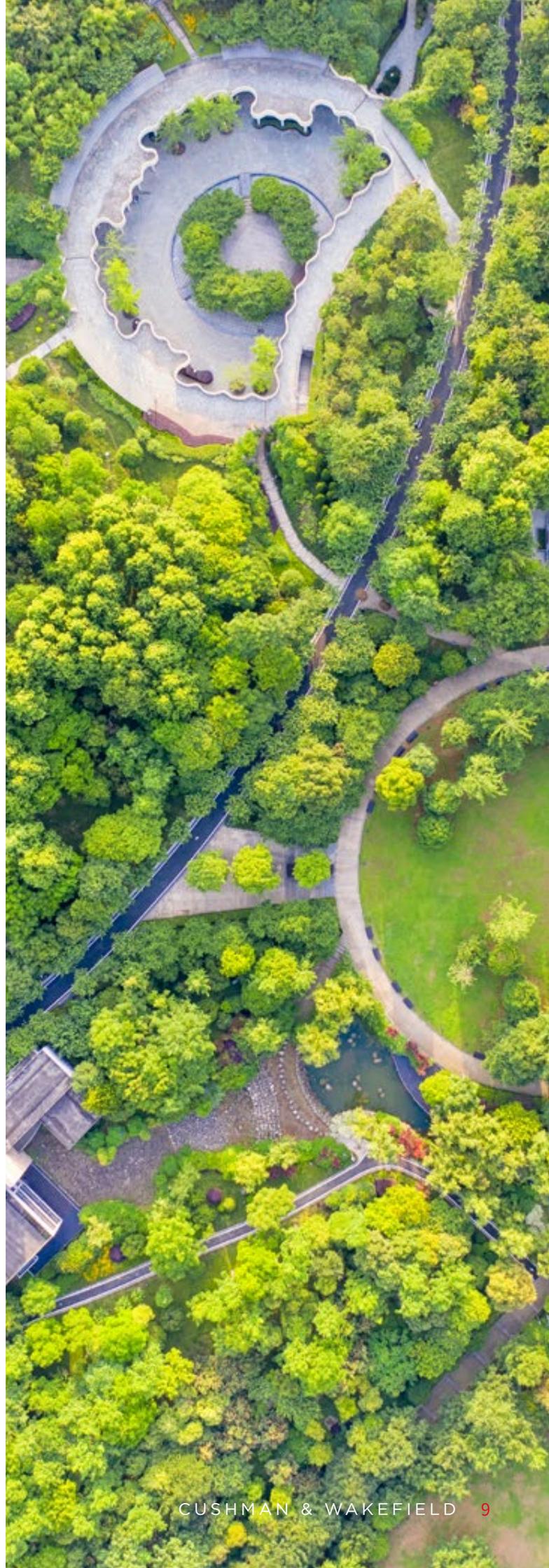
Low chemical emission fit-out materials and furnishings should be installed and used. Vapour barriers can be designed-in and implemented to curtail vapor incursion, and humidity levels should be alleviated to limit odours.

## ***Temperature and humidity***

Indoor temperature and humidity levels should meet with typical comfort standards at any given time of the day or the night.

## ***Damp and fungus***

Any damp sources and condensation spots within the residential building's envelope need to be identified and alleviated. Regular inspections should be conducted to find and remedy any moisture sources and condensation spots within the building's envelope.





## ***Dust, grime and pests***

Surfaces should be wiped, swept and/or cleaned at regular intervals. Pest matters should be preempted by employing deterrent procedures, such as closing off entry points, stopping moisture accumulation, and getting rid of rubbish as quickly as possible.

## ***Water quality***

Water should be recurrently tested, and quality standards should be maintained to regional levels. To further improve on water quality, an in-house water purification system could be installed to eradicate contamination. What's more, water pipes should be intermittently checked to ensure stagnant water is not present.

## ***Noise pollution***

Both outdoor noise and indoor noise needs to be controlled and regulated. Good construction design and use of materials can assist in dampening noise levels. Noise sources should emit a background noise below 35db, and maximum reverberation time should be under 0.7 seconds.

## ***Lighting and views***

All internal spaces should ideally have direct lines of sight to exterior windows and daylight. There should be adequate lighting for daily tasks to be carried out, and as much natural daylight as achievable without triggering glare.

## ***Safety and security***

Ample lighting, video monitoring, fire safety preparations and precautions, and a maintained emergency action plan can ease safety concerns and reduce stress within a residential community.

# THE HEALTHY RESIDENTIAL HOUSING MARKET IN CHINA

## *Policy*

In September 2020, it was proposed at the highest levels in China that the country's scientific and technological development must adhere to 'four orientations': an orientation to the frontiers of world science and technology, an orientation to the economy, an orientation to the country's needs and an orientation to people's lives and health.

In response to this aspiration, the Green Building Creation Action Plan was jointly issued by seven ministries and commissions. Among other things, this document looks to improve the health performance of residential buildings in the region by:



- Enhancing the implementation of relevant residential health standards;
- Augmenting residential building health performance indicators related to indoor air quality, water quality, and sound insulation quality, and;
- Bettering the visual and psychological comfort of residential buildings.

Moving forward, the document suggests that greater awareness of and much improvement in residential building health can be achieved through:

1. The promotion of residential health performance demonstration projects;
2. The strengthening of residential health performance design requirements;
3. More stringent property management practices, processes and procedures, and;
4. The adaption and integration of building health-associated technologies.

Other policies associated with the promotion of health and wellbeing within residential communities include:

# 1

The 14th Five-Year Plan - which touches on aspects associated with the promotion and improvement of resident welfare over the next five years.

# 2

Healthy China 2030 - incorporates a number of health-related goals to focus on. Residential communities can help to achieve some of these goals by:

- Providing set-aside areas and facilities for fitness and wellbeing within the community;
- Organising fitness and wellbeing programmes that embrace all members of the community, and;
- By making sure all environmental hazards, including air, water and noise pollution are mitigated (Figure 2 and Figure 3).

Figure 2: Healthy China 2030 - A holistic approach to health



Figure 3: Healthy China 2030 - 15 goals



Source: Healthy China 2030, Cushman & Wakefield Research

Source: The National Health Commission (PRC), Cushman & Wakefield Research

Apart from general policy, several residential-related healthy building standards have also been released and enacted in China and some of these standards include:

**2009** – China Engineering Construction Association (CEC) published the Technical Specification for Healthy Housing (CECS 179-2009);

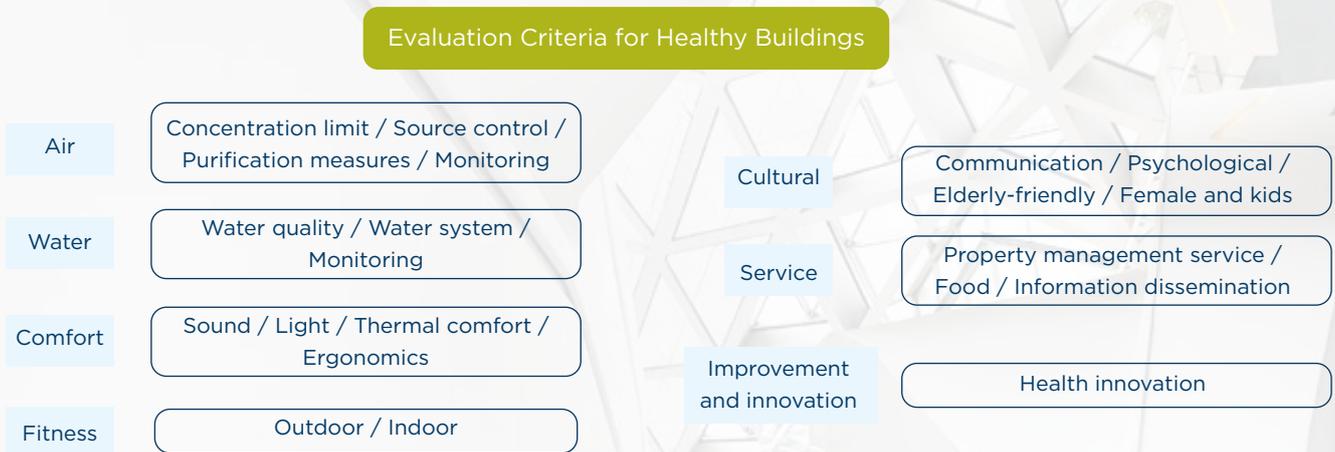
**2013** – The Residential Health Performance Evaluation Scheme (2013 Edition), edited by the National Engineering and Technology Research Centre for Housing and Living Environment, was released;

**2016** – The Standardisation Committee of the Chinese Institute of Architecture issued the Evaluation Standard for Healthy Buildings (T/ASC 02-2016) (Figure 4);

**2017** – The China Engineering Construction Standardisation Association published the Evaluation Standard for Healthy Housing (T/CECS 462-2017) ;

**2019** – The Ministry of Housing and Urban-Rural Development released a new version of the Green Building Evaluation Standard (GB/T 50378-2019) and added an entry for "health and comfort" evaluation.

Figure 4: Evaluation Criteria for Healthy Buildings (T/ASC 02-2016)



Source: Assessment Standard for Healthy Buildings T/ASC 02-2016, China Academy of Building Research, Cushman & Wakefield Research

# The Market

## Criteria

For the purposes of this report, to be categorised as a certified healthy residential building, a property has to satisfy certain criteria:

- Evidence of a healthy building certification, and/or;
- Has integrated a healthy building-related standard/scheme/technology.

As for satisfying these criteria, investors, developers and owners in China have a number of options available to them, as noted previously. Two examples, however, are the International WELL Building Institute (IWBI) and their WELL Building Standard version 2 (WELL v2) certification, and the already mentioned Evaluation Standard for Healthy Housing (T/CECS 462-2017).

Going into a little more detail, WELL v2 is a single rating scheme that is created to include all project types and sectors. The scheme is designed to adapt and grow in specificity and specialty over the course of time, as both real estate and health-related issues evolve. Under the WELL v2 certification standard, there are 10 basic concepts and they are depicted in Figure 5. Each of these 10 concepts is based upon features with well-defined health objectives. Features are either preconditions or optimisations.

Figure 5: WELL v2 - The 10 concepts



Source: IWBI, Cushman & Wakefield Research

WELL v2 projects fall into one of two main baskets and these baskets are established principally by ownership type. The first type of project is an owner-occupied project, where the project is mainly occupied by the project owner. The second type of project is called a WELL Core project. Here the project owner occupies a minor part of the project area and leases the rest of the project space to one or more tenants.

When specifically looking at residential buildings, multifamily residential building projects may engage WELL if they have at least five housing units in a single residential building with common structural elements. Projects that are eligible are apartments, condominiums, townhouses and other residential communities within all market thresholds – from affordable housing to luxury housing.

Multifamily residential building projects use the WELL Certification pathways (i.e., not WELL Core), even though the majority of the usual occupants are tenants, and the project owner may not complete the fit-out of the housing units.

Performance testing within housing units for precondition features is not needed for

multifamily residential building projects looking to gain certification at the Bronze or Silver level. However, projects cannot attain Gold or Platinum without testing conditions in a sample of housing units. For optimisations, testing within housing units is needed, whether or not the project is going for Gold or Platinum. At recertification, for all levels of certification, testing is not needed within housing units. Only common areas and spaces devoted to building management need to be tested.

Projects must attain all preconditions, as well as a specific number of points towards different levels of WELL certification: Projects may go for no more than 12 points per concept and no more than 100 points total among the 10 concepts. Projects can also go for an extra 10 points in the Innovation concept. A project can pursue further points in concepts where the project has already reached the 12 point limit, by submitting features or parts not already pursued within those concepts as innovations for Feature I01. These submissions are worth one point per part, irrespective of the listed point value of that part (Table 1).

**Table 1: WELL v2 certification scoring and levels**

Total points achieved	WELL Certification		WELL Core Certification	
	Minimum points per concept	Level of certification	Minimum points per concept	Level of certification
40 pts	0	WELL Bronze	0	WELL Core Bronze
50 pts	1	WELL Silver	0	WELL Core Silver
60 pts	2	WELL Gold	0	WELL Core Gold
80 pts	3	WELL Platinum	0	WELL Core Platinum

Source: IWBI, Cushman & Wakefield Research

Regarding the second criteria, a number of developers in China have adopted a health-related building scheme/technology, including Poly, Vanke, Greenland, Sino-Ocean and China Jinmao. Many have also followed an evaluation standard, including the Evaluation Standard for Healthy Housing (T/CECS 462-2017).

The Evaluation Standard for Healthy Housing (T/CECS 462-2017) aims to promote the construction of healthy residential housing in China, implement the concept of healthy housing, and improve people’s health and living standards. Additionally, the standard not only acts as a guide for the construction, operation and certification of healthy residential housing projects, but also aspires to standardise the evaluation system for healthy residential

housing projects in China.

The standard goes on to define a healthy residential house as a dwelling and its living environment which can improve the physical, psychological, moral and social wellbeing of residents. By meeting the standard criteria related to healthy residential housing living function and ‘green’ development, a healthy residential building is in a position to provide its residents with a healthier living environment, facilities and services.

The evaluation process for the standard comprises of six components, encompassing space comfort, air quality, water quality, a quiet environment, good lighting and health promotion (Figure 6).

Figure 6: Evaluation Standard for Healthy Housing (T/CECS 462-2017)



Source: Evaluating Standard for Healthy Housing T/CECS 462-2017, China National Engineering Research Center for Human Settlements, Cushman & Wakefield Research

Each component includes control items and scoring items. The control item is the indicator that must be achieved – whether the evaluation result is satisfied or not satisfied.

The scoring item is the score value. Consistent with the standard, a healthy residential housing project is graded according to the overall score. Furthermore, the maximum score values of five of the components: space comfort, air quality, water quality, a quiet environment and good lighting, are 100 points each, and the maximum score value of the sixth component, the health promotion component, is 120 points. The achieved score of each component is then reached by dividing the total score of the individual component and multiplying it by 100 – this is the actual score for each component (Q1-Q6). The overall score is then calculated according to the following formula:

$$Q = w1Q1+ w2Q2+ w3Q3+ w4Q4+ w5Q5+ w6Q6...$$

...with the weighting for the six components in the evaluation system w1-w6 being calculated according to the figures indicated in Table 2.

**Table 2: The Evaluation Standard for Healthy Housing (T/CECS 462-2017) – The weighting for the six evaluation indicators**

Indicators	Space comfort	Air quality	Water quality	Quiet environment	Good lighting	Health promotion
Construction evaluation	16%	18%	15%	14%	12%	25%
Operation evaluation	15%	17%	14%	13%	11%	30%

Source: Evaluation Standard for Healthy Housing (T/CECS 462-2017), Cushman & Wakefield Research

Lastly, along with the standard, healthy residential housing is divided into three grades; one-star, two-star and three-star. When the overall score for a healthy residential housing project reaches 50 points, 60 points and 80 points, under the standard, the residential housing project can receive either a one-star, two-star or three-star healthy residential housing project certification, respectively.

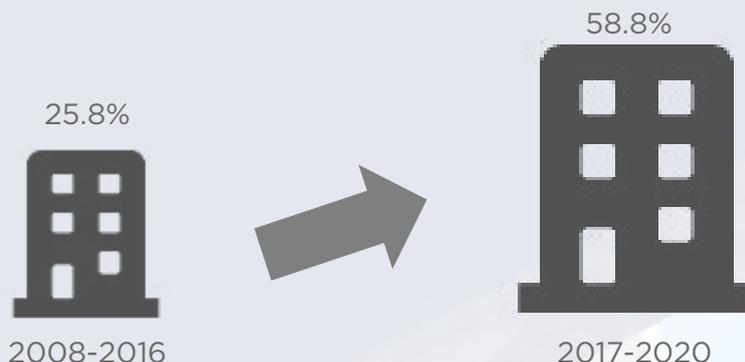
## *Healthy residential housing supply has ballooned in recent years*

As can be seen from Figure 7, when explicitly focusing on healthy residential projects, and in particular, certified residential projects built by a representative group of 10 selected major developers, several years before 2017, healthy residential housing building volume in China was relatively small. Over the eight-year period between 2008 and 2016, the average

accumulated supply growth rate for this asset class was 25.8%. However, over recent years, the accumulated residential supply with “health” as a major theme has grown significantly. Over the four-year period, between 2017 and 2020, the average growth rate for accumulated healthy residential project supply, built by this group of selected

developers, grew by a substantial 58.8%. Ahead, once awareness of the benefits of living in healthy residential housing is higher among more of the general public, so we expect the supply volume of healthy residential housing in China to further expand in the years to come.

**Figure 7: Healthy residential housing project supply in China - Average accumulated growth rate (Built by a representative group of selected developers) (2008-2020)**

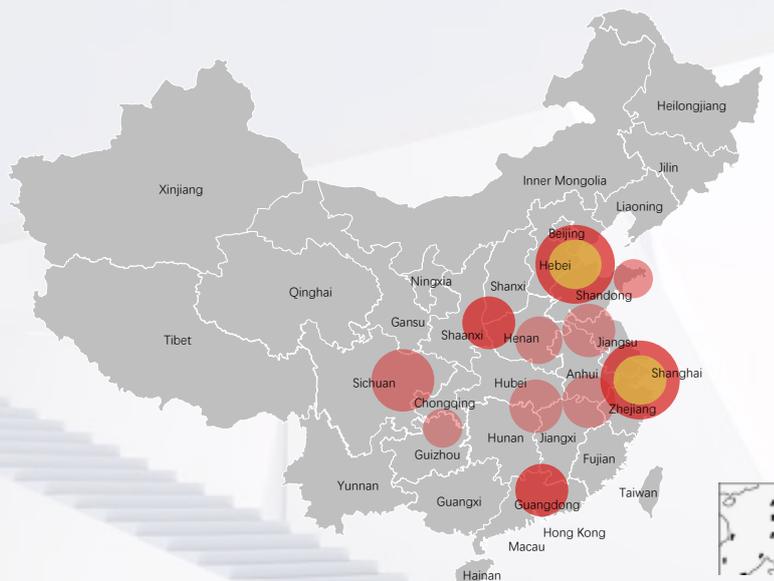


Source: Cushman & Wakefield Project & Occupier Services, Cushman & Wakefield Research

## Geographical distribution

Based on the certified healthy residential projects built by the representative group of 10 selected developers, the distribution of healthy residential building projects in China is as high as 80% in the eastern provinces, with the rest mainly concentrated in the Chengdu-Chongqing metropolitan corridor area. The major developers which are developing certified healthy housing projects are currently focusing their efforts on first- and second-tier cities, with some involvement in third- and fourth-tier cities. The heat map below is based on the existing stock of healthy residential housing projects built in China by the representative group of 10 selected developers (Figure 8).

**Figure 8: Heatmap - Healthy residential building distribution in China (Built by a representative group of selected developers) (2021)**



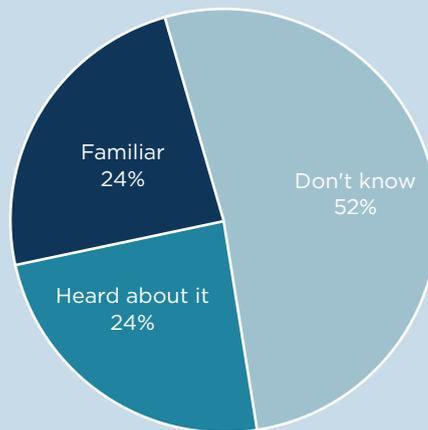
Source: Cushman & Wakefield Project & Occupier Services, Cushman & Wakefield Research

# CONSUMER SENTIMENT IN CHINA

Awareness of the importance of living in a healthy residential dwelling is increasing in China.

Nearly a decade back, as stated by a market survey by Fang.com on the awareness of healthy housing, it can be seen that only about 24% of consumer respondents were familiar with the concept of healthy housing. Furthermore, about 24% had a slight understanding of healthy housing, and more than 50% had no idea about it (Figure 9).

Figure 9: Consumer survey on the awareness of healthy residential housing in the Beijing area (2013)



Source: Fang.com, Cushman & Wakefield Research

However, it can be seen from a survey at the same time by Shanghai Zhongze Real Estate Investment Consulting that consumer survey respondents were positive in terms of the implementation of healthy housing irrespective of if they had heard of the concept or not (Table 3).

Table 3: Consumer survey on the awareness of healthy residential housing in China (2013)

		Very much looking forward to have	Better to have	Neutral	No need	Total
<b>Have you heard of healthy homes?</b>	Yes	21.8%	69.2%	7.7%	1.3%	100%
	No	21.7%	56.7%	18.3%	3.3%	100%
	Not Sure	18.4%	60.5%	18.4%	2.6%	100%

Source: Shanghai Zhongze Real Estate Investment Consulting, Cushman & Wakefield Research

Today, however, and especially after the COVID-19 epidemic, the degree of awareness of healthy residential housing in China has changed.

The emergence of the epidemic early in 2020 understandably increased people’s anxiety about the health of their living environment. A survey by NetEase Real Estate, revealed that during the height of the epidemic, most housing occupiers in China were either unsatisfied or neutral in their view of the level of general health of their current dwelling (Figure 10).

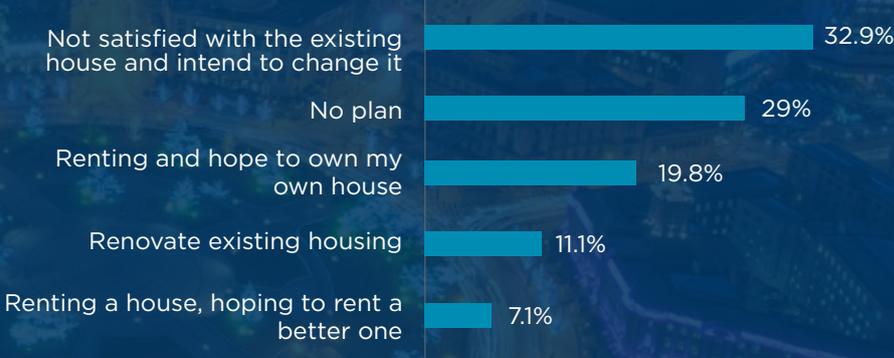
Figure 10: China housing owner/user sentiment survey regarding the health of their housing (Early 2020)



Source: NetEase Real Estate, Cushman & Wakefield Research

Housing owners/users in China are now more aware of the importance of healthy residential housing and are now more proactive at improving the health levels of their residential dwelling. According to a recent survey by Baixing Finance & Economics, over 70% of respondents intend to improve their living environment and the health level of their home by either remodelling their existing home, buying a new house or renting a better one (Figure 11).

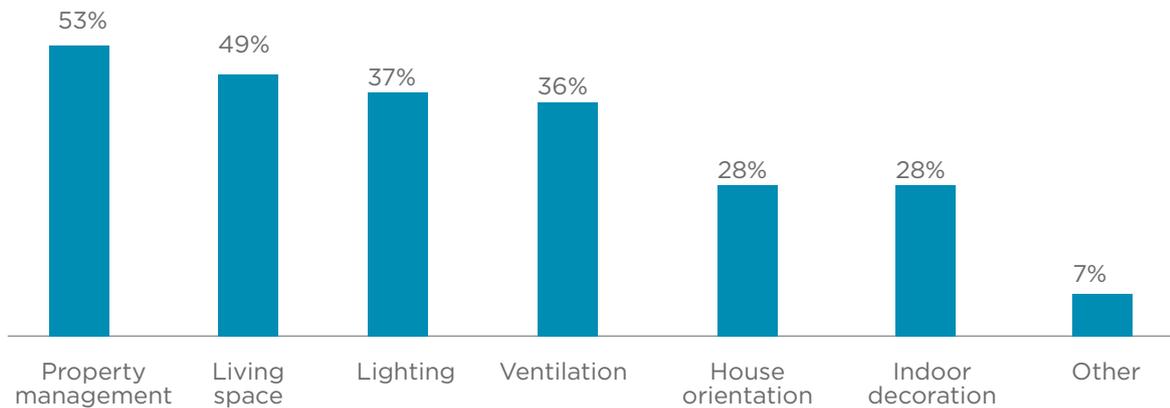
Figure 11: China housing owner/user sentiment survey – Since the epidemic, what are your intentions regarding the health levels of your home? (2020)



Source: Baixing Finance & Economics, Cushman & Wakefield Research

Moving the current China housing sentiment survey detail dial a little further, as reported by NetEase Real Estate, most owners/users are dissatisfied with their property management team and their living space when it came to level of health within their general residential community living environment (Figure 12).

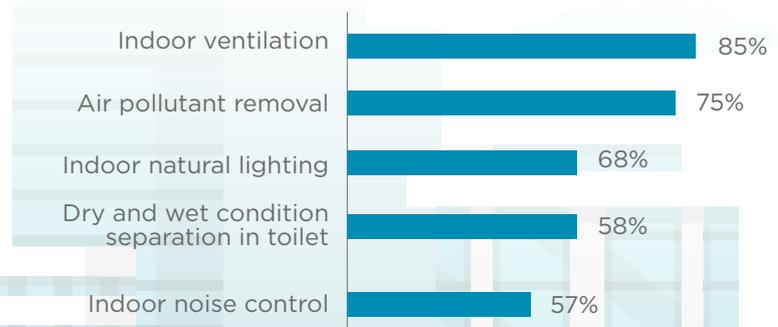
**Figure 12: China housing owner/user sentiment survey – Since the epidemic, what aspects are you most dissatisfied regarding your general residential community living environment? (2020)**



Source: NetEase Real Estate, Cushman & Wakefield Research

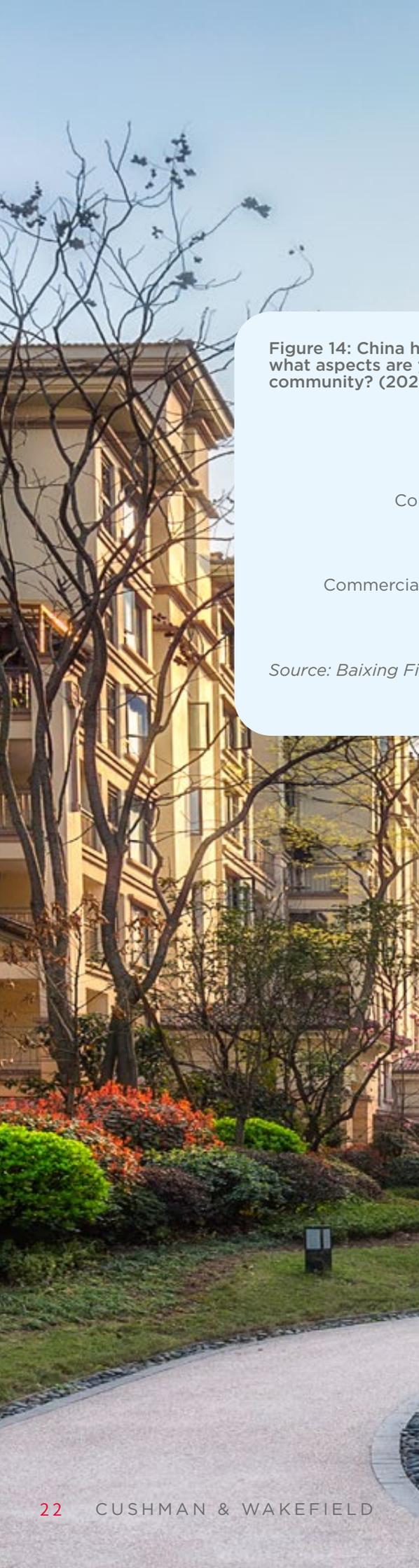
Focusing more on the internal living area of residential housing projects, however, a survey conducted by China Overseas suggests that indoor ventilation and air pollution are issues that most concern homeowners/users in China now (Figure 13).

**Figure 13: China housing owner/user sentiment survey – Since the epidemic, what aspects are you most dissatisfied regarding your internal residential housing living area? (2020)**



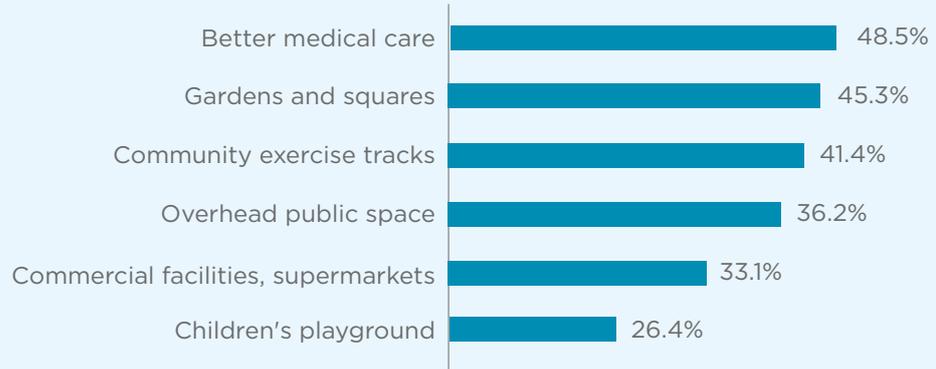
Source: China Overseas, Cushman & Wakefield Research





Broadening the survey to the wider living community, according to Baixing Finance & Economics, many homeowner/user respondents in China suggested that gardens and squares and community exercise tracks were the top two physical aspects of a residential community which still have room for improvement (Figure 14).

**Figure 14: China housing owner/user sentiment survey – Since the epidemic, what aspects are you most dissatisfied regarding your surrounding residential community? (2020)**



*Source: Baixing Finance & Economics, Cushman & Wakefield Research*

Additionally, there is the whole aspect of psychology. The mental side of health should not be ignored and how residential housing is planned, designed, built and operated has some bearing on degree of mental wellbeing that is present among the residential housing owners/users at any given time.

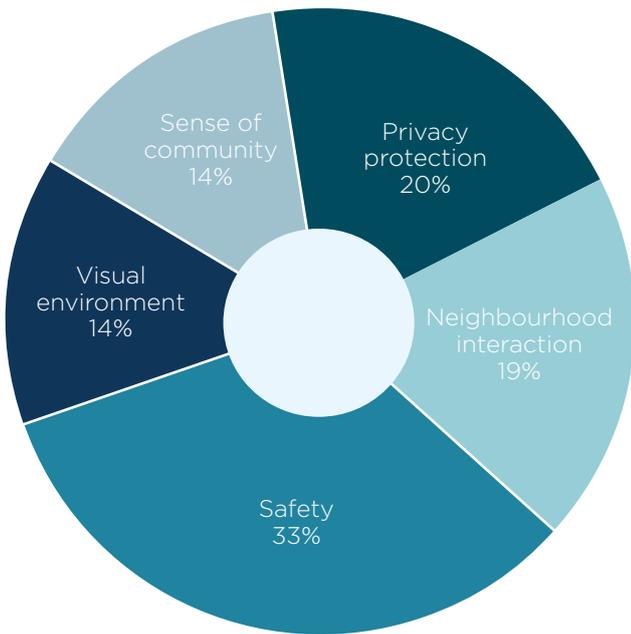
Depression is a big part of mental illness and when it comes to residential housing a number of factors can lead to or exacerbate mental depression, including:

- A lack of privacy;
- A lack of a sense of safety and security;
- Little neighbourhood interaction;
- Lack of a general community, and;
- A generally poor visual environment.

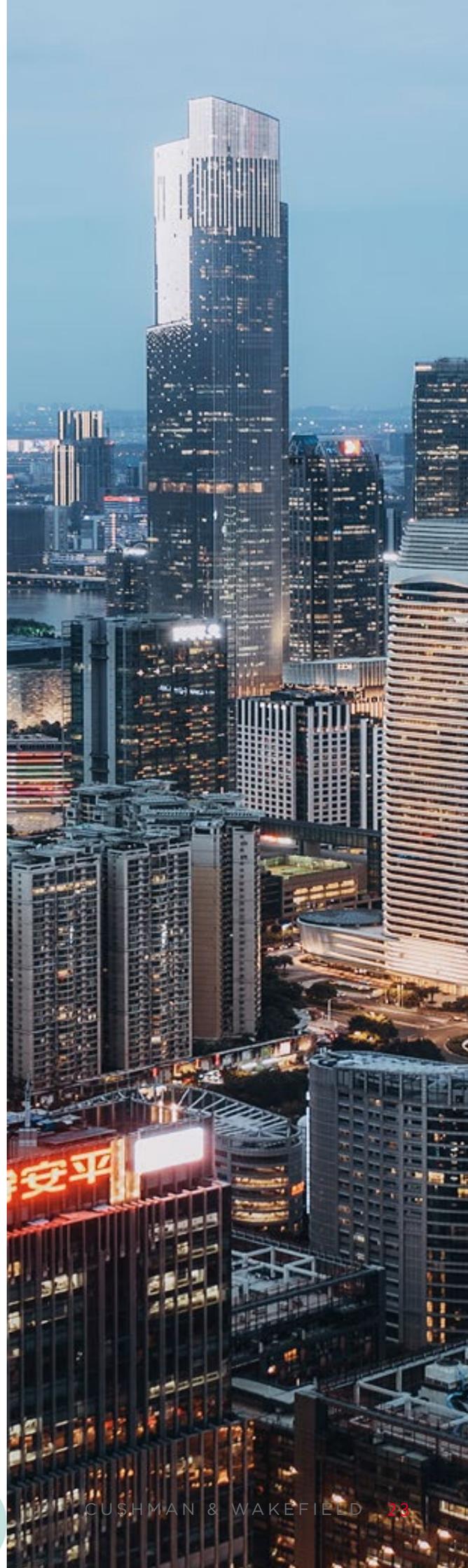


Consistent with a survey by China National Engineering Research Center for Human Settlements, the biggest residential housing issue rated to depression in China is safety and security within a residential housing project (Figure 15).

Figure 15: China housing owner/user sentiment survey - What are the biggest issues, related to the residential community you live in, that impact your mental wellbeing? (2020)



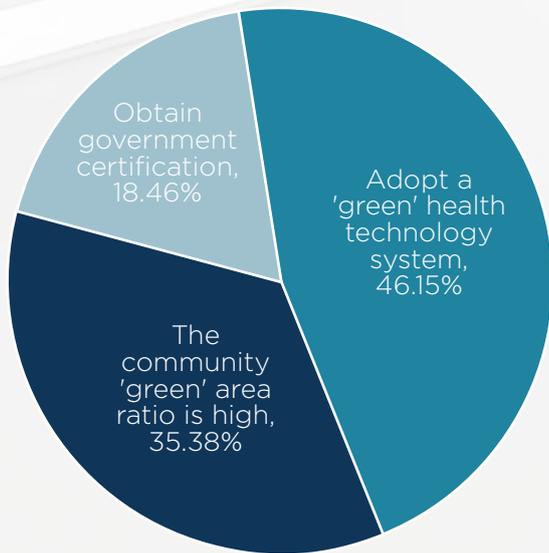
Source: China National Engineering Research Center for Human Settlements, Cushman & Wakefield Research



So, in the eyes of homeowners/users in China, what are some of the important qualifications a residential community project needs to qualify as a healthy project? On this note, a survey conducted by Fang.com points to three important criteria being (Figure 16):

- ▶ The adoption and implementation of a health technology scheme for the community;
- ▶ Enjoying a high 'green' area ratio, and;
- ▶ In possession of a government approved healthy residential community certificate.

**Figure 16: China housing owner/user sentiment survey - What are some of the important qualifications a residential community project needs to qualify as a healthy project? (2020)**



Ultimately, if a residential housing project is deemed to be healthy, then living in such a project should benefit the residents in many ways both mentally and physically. Should these health benefits be translated to such healthy residential housing projects in China enjoying higher prices? Overwhelmingly, as suggested in a consumer survey by Shanghai Zhongze Real Estate Investment Consulting, the answer is an even balance between yes and no (Table 4).

Source: Fang.com, Cushman & Wakefield Research

**Table 4: Consumer survey on whether the price of healthy residential housing projects in China should be raised or not (2020)**

	Should we raise the price of healthy houses				Total
		We should	We shouldn't	Don't know	
<b>Have you heard of the concept of healthy housing</b>	Yes	55.1%	32.1%	12.8%	100%
	No	40.0%	46.7%	13.3%	100%
	Not Sure	23.7%	55.3%	21.1%	100%
	Total	43.2%	42.0%	14.8%	100%

Source: Shanghai Zhongze Real Estate Investment Consulting, Cushman & Wakefield Research



# TWO HEALTHY RESIDENTIAL HOUSING PROJECT CASE STUDIES

## 21W20 FLATIRON, NEW YORK CITY

### Project intro

Today, there are many residential projects around the world that have been planned, designed, built and now operated that have achieved a high standard of health. One international example of this group of buildings is 21W20 Flatiron in New York City (Figure 17).



Figure 17: 21W20 Flatiron, New York



Source: Cushman & Wakefield Research

### Project background:

Built in 2016, the project is located in the Flatiron district of Manhattan, one of the most vibrant areas of New York City, with modern stores and art galleries at hand to enrich the living experience of residents.

Developed by Gale International Development, the high-rise apartment building incorporates the latest

technology and design concepts to create apartments that place occupant and user health at the top of the agenda.

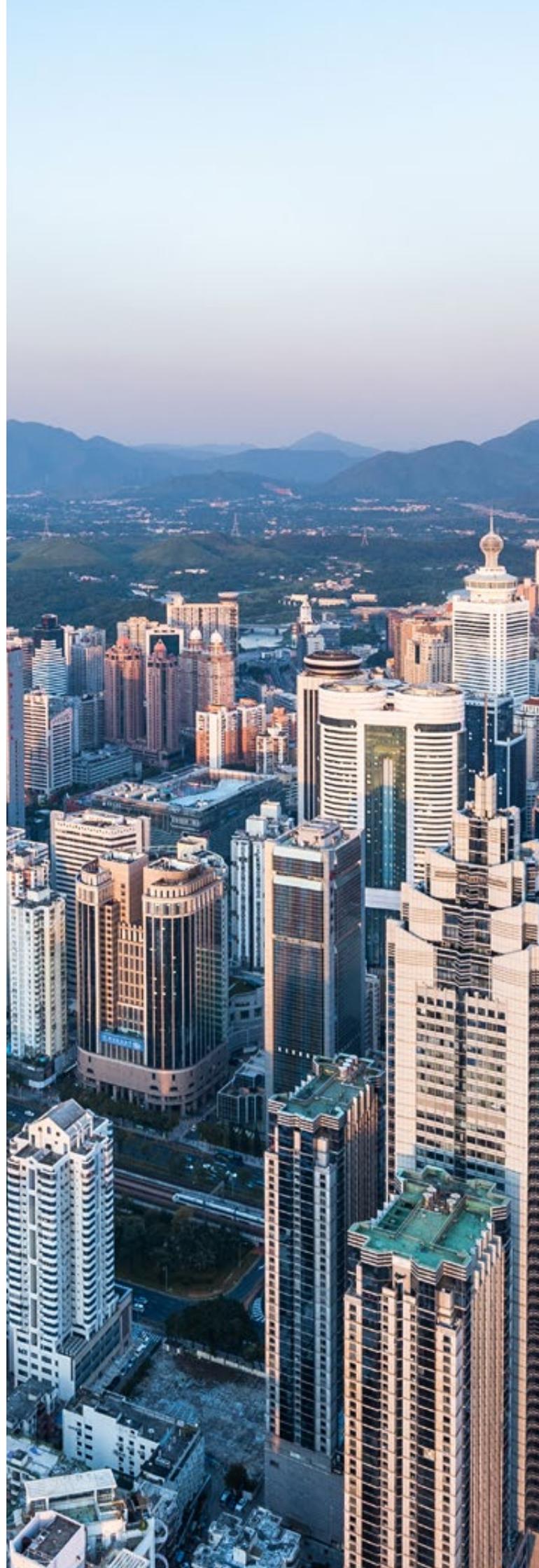
The 13-unit, full-floor housing development project, originally a protected New York City landmark, was renovated with the façade material being replaced with glass, cast iron and stone.

## *Project healthy building certification:*

Having employed renowned designer David Mann to modernise the colour and light to meet the aesthetic requirements while helping to soothe residents, 21W20 Flatiron has received a WELL Silver rating, becoming the first multifamily residential project in the world to be certified under the WELL Building Standard.

The project was able to achieve this certification by introducing many health-related improvement features, including components that can abate interruption to circadian rhythms, enhance sleep, reinforce healthy eating, improve air quality and optimise cognitive and emotional health.

All through the certification process, Gale International applied ground-breaking approaches in order to advance resident health and well-being and realise the Multifamily Certification.



# LANDSEA YUE MANSION, HANGZHOU

## Project intro

Today, China too has its fair share of certified healthy residential housing projects and one project example is Landsea Yue Mansion in Hangzhou (Figure 18).



Figure 18: Landsea Yue Mansion, Hangzhou



Source: Cushman & Wakefield Research

## Project background:

Landsea Yue Mansion is located in Hangzhou, Zhejiang province. It has a floor area of 80,600 sq m. A major objective of this project is to optimise the physical and mental wellbeing of its residents. It does this by ensuring the project buildings are 'green' and have a high level of comfort and health performance.

## Project healthy building certification:

Integrated into Landsea Yue Mansion is a healthy residential building design concept, building materials that are optimised in terms of health and safety, and a variety of assimilated healthy residential building technologies. By implementing these features, the project has achieved significant improvements in the quality of its indoor and outdoor environment, its air quality, its water quality, and the quality of its general facilities, over the norm – to the benefit of its user and owner groups. Subsequently, Landsea Yue Mansion has obtained a healthy residential housing three-star certification under the Evaluation Standard for Healthy Housing (T/CECS 462-2017) scheme.

# AN OUTLOOK FOR THE HEALTH OF RESIDENTIAL BUILDINGS IN CHINA

Ahead, as both citizens and authorities in China become even more aware of the benefits healthy residential projects can bestow, so we expect the number of these types of projects in China to grow.

The prospect to markedly further augment the health of residential buildings in China through investments in higher quality design, layout, materials, products, technology and schemes is sizable. Future related goals and objectives are many and some selected ones include:

## *Goal 1: Realise main health gains and augment industry understanding*

- A. Further undertake healthy residential building-related research and further develop a healthy residential assessment methodology;
- B. Work with public health authorities to create a public health metric to act as a baseline against which to illustrate health gains;
- C. Further expound particular health benefits from best indoor environmental quality (IEQ) practice and further assemble evidence to show that the benefits are as a result of measures taken, and;
- D. Further offer and deliver information/education to promote understanding and action.

## *Goal 2: Spur wide-reaching action to improve health in existing residential buildings*

- A. Recognise and plug knowledge gaps in relation to healthy residential building best practice;
- B. Further build up and further advance first-rate IEQ standards;
- C. Create particular guidance documents for different stages in the life cycle of a building;
- D. Create metrics for a performance-based building rating/certification programme;
- E. Offer information material for self-home improvers, and;
- F. Create checklists for residential building owners/users.

## *Goal 3: Fashion and utilise ground-breaking design, materials, products and technology*

- A. Further develop residential building design to enhance overall building health;
- B. Further improve tools to lessen indoor health risks;
- C. Continue to record and assess cutting-edge sensors, test kits, and indoor-related prevention and control technologies before they are made available to the market;
- D. Continue to record and evaluate risk assessments on new products and materials before they are made available to the market;
- E. Further advance product and material assessment and testing procedures;
- F. Offer market incentives to push producers to bring to market new materials, new products and new technologies, and;
- G. Continue to work with involved participants to upgrade and propagate product labels, instructional materials, improved material safety data sheets, and product specifications.

# AN OPTIMUM HEALTHY RESIDENTIAL BUILDING SYSTEM AND HOME

As the health of residential buildings in China is further augmented, a healthy residential housing system can be generated and utilised by developers and asset owners. Table 5 is one such system example. This particular system has been derived from an assessment of the healthy residential housing systems currently employed by 10 developers in China.

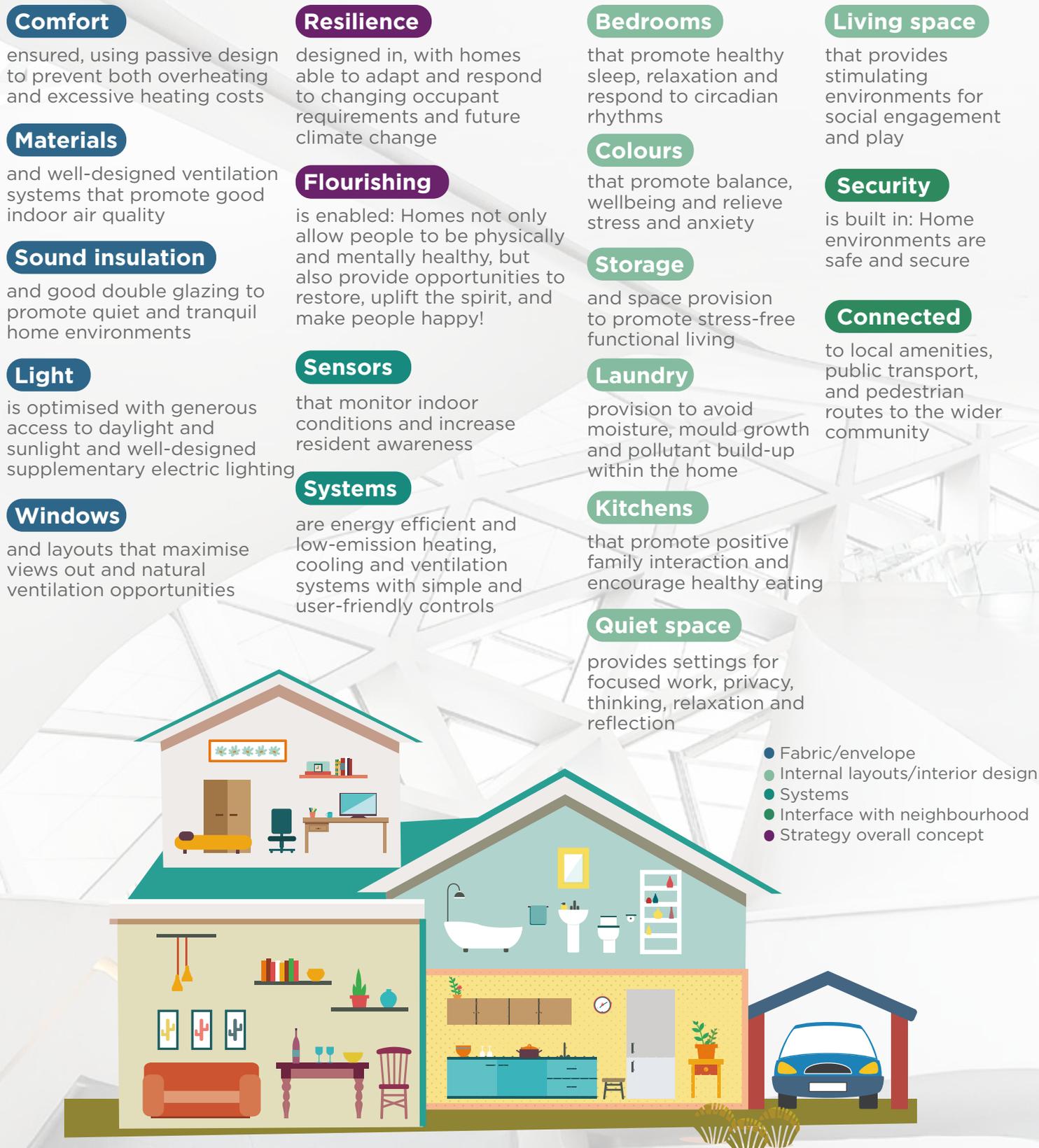
Table 5 : A healthy residential housing system

Healthy housing system been divided into 12 major categories, 53 sub-items			
1	Healthy air	<ul style="list-style-type: none"> <li>• Air filtration system</li> <li>• Fresh air system</li> <li>• Air disinfection system</li> </ul>	<ul style="list-style-type: none"> <li>• Air monitoring system</li> <li>• Smoke and odor prevention system</li> </ul>
2	Healthy water	<ul style="list-style-type: none"> <li>• Kitchen water purification function</li> <li>• Toilet water purification function</li> </ul>	<ul style="list-style-type: none"> <li>• Household water purification function</li> <li>• Water quality monitoring system</li> </ul>
3	Noiseless environment	<ul style="list-style-type: none"> <li>• Noiseless air conditioning equipment</li> <li>• Soundproof doors and windows</li> <li>• Floor sound insulation system</li> </ul>	<ul style="list-style-type: none"> <li>• Same floor drainage system</li> <li>• Noise reduction barrier or planting</li> </ul>
4	Cozy temperature and humidity	<ul style="list-style-type: none"> <li>• Fission air conditioner</li> <li>• Central air conditioning</li> </ul>	<ul style="list-style-type: none"> <li>• Floor heating</li> </ul>
5	Healthy lighting system	<ul style="list-style-type: none"> <li>• Lighting colour and brightness can be adjusted</li> <li>• Anti-glare design</li> </ul>	<ul style="list-style-type: none"> <li>• Set up inductive night light</li> <li>• Passive lighting (natural lighting)</li> </ul>
6	Household sanitary disinfection system	<ul style="list-style-type: none"> <li>• Entrance area</li> <li>• Kitchen area</li> <li>• Toilet area</li> </ul>	<ul style="list-style-type: none"> <li>• Dining cupboard</li> <li>• Lift</li> </ul>
7	Healthy green landscape	<ul style="list-style-type: none"> <li>• High 'green' area ratio landscape layer</li> <li>• Full season greening</li> <li>• Antimicrobial vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• Landscape microclimate</li> <li>• Outdoor smoking-free point</li> </ul>
8	Healthy catering facilities and services	<ul style="list-style-type: none"> <li>• Community supermarket</li> </ul>	<ul style="list-style-type: none"> <li>• Community canteen</li> </ul>
9	Healthy activity space	<ul style="list-style-type: none"> <li>• Community exercise track</li> <li>• Children's playground</li> <li>• Activity area for the elderly</li> </ul>	<ul style="list-style-type: none"> <li>• Basketball and badminton courts</li> <li>• Indoor activities and swimming pool</li> </ul>
10	Community healthy service	<ul style="list-style-type: none"> <li>• Community clinics, pharmacies</li> <li>• Psychological counseling room</li> <li>• Remote medical system</li> </ul>	<ul style="list-style-type: none"> <li>• On-site health testing</li> <li>• Decompression room</li> </ul>
11	Healthy community activities	<ul style="list-style-type: none"> <li>• Ball games</li> <li>• Hiking</li> <li>• Mental health salon</li> </ul>	<ul style="list-style-type: none"> <li>• Flea market</li> <li>• Holiday events</li> </ul>
12	Intelligent health facilities	<ul style="list-style-type: none"> <li>• Contactless home entry</li> <li>• Automatic detection alarm</li> <li>• Intelligent community detection</li> </ul>	<ul style="list-style-type: none"> <li>• Intelligent security system</li> <li>• Sleep health monitoring</li> </ul>

Source: Cushman & Wakefield Project & Occupier Services, Cushman & Wakefield Research

Finally, from the adoption of such a healthy residential housing system, a greater amount of healthy residential homes, which incorporate healthy design, materials, products and technology, can be realised in China (Figure 19).

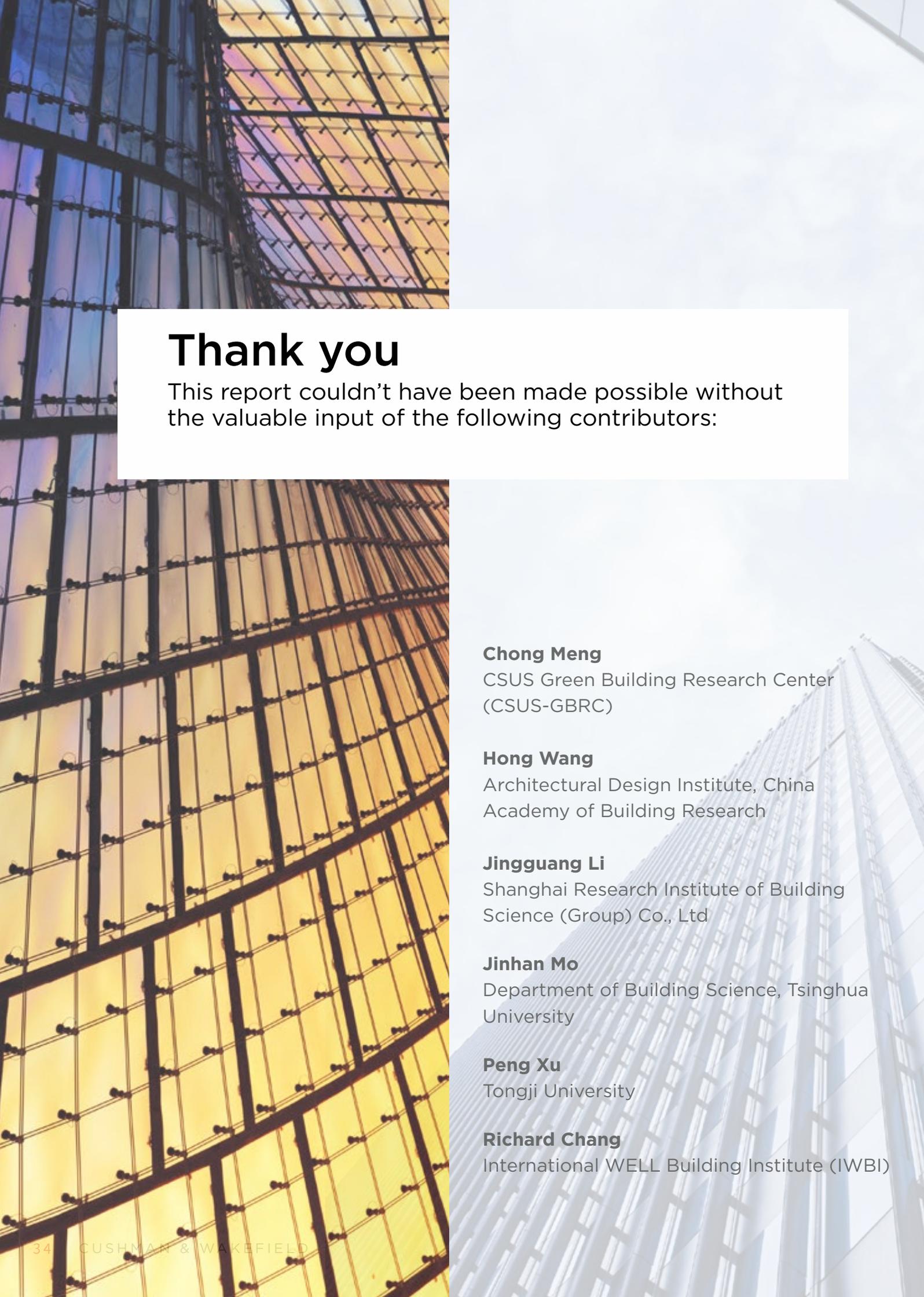
Figure 19: A healthy residential home



Source: Treehugger.com, Cushman & Wakefield Research

# KEY TAKEAWAYS

- Generally around the world, as much as 60% of our time is expended at home during the day and that's not even making an allowance for the one-third of our time devoted to sleeping at night.
- Levels of pollution within buildings in many locations globally, including in some residential buildings, are frequently greater than levels recorded outside.
- When looking to improve residential building health, there are many ways this can be accomplished, but nine principal areas that can be observed, addressed and improved upon are:
  - Air conditioning and ventilation;
  - Air quality;
  - Temperature and humidity;
  - Damp and fungus;
  - Dust, grime and pests;
  - Water quality;
  - Noise pollution;
  - Lighting and views, and;
  - Safety and security.
- Investors, developers and owners in China have a number of healthy building certification choices open to them. Two examples, however, are the International WELL Building Institute (IWBI) and their WELL Building Standard version 2 (WELL v2) certification, and China's Evaluation Standard for Healthy Housing (T/CECS 462-2017).
- After 2017, the new housing supply with "health" as a key theme has expanded. Between 2017 and 2020 the average accumulated growth rate for certified healthy residential housing supply volume in China, (built by a representative group of 10 selected major developers), reached 58.8%.
- Once mindfulness of the advantages of living in healthy residential housing is present in more of the general public, so we anticipate the supply volume of certified healthy residential housing in China to further pick up in the years to come.
- As per a recent survey by Baixing Finance & Economics, over 70% of respondents plan to improve their living environment and the health level of their home by either modifying their existing home, buying a new house or renting a better one.
- As the health of residential buildings in China is further enhanced, a healthy residential housing system can be created and employed by developers and asset owners.
- Lastly, from the adoption of such a healthy residential housing system, a greater amount of certified healthy residential homes, which integrate healthy design, materials, products and technology, can be realised in China.



# Thank you

This report couldn't have been made possible without the valuable input of the following contributors:

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