



The future of sustainability

Earle Arney and Chris Mobbs

The building industry is generally risk averse, with a reluctance to accept new building technologies without proof that they work. This is understandable given the significant investments locked-up in property which is the world's largest asset class by a significant margin (Snushall, Cronin, Spencer & Cameron, 2005). However, we believe that we have reached the point where, failure to innovate today or be a leader of sustainability will render property assets obsolete in the next property cycle. The failure to future proof a building will result in it being passed over in favour of a new generation of buildings appealing to a new generation of global citizens. Given this shift, what does the future hold? To help answer this question, we consulted a number of leading property industry innovators, owners, developers and end users from around the world to help understand what they see in the crystal ball.



Paul Edwards is the Director of Sustainability for Hammerson, a FTSE100 European property owner and developer based in the UK. He returned to the UK in 2007, following ten years in Australia where he worked for Lend Lease and Arup. Whilst in Australia he was responsible for the delivery of sustainability at The Bond, Lend Lease headquarters in Sydney, which received over thirty-six awards and was the first building to achieve 5 Star ABGR and 5 Green Star As Built ratings.

Interview with Paul Edwards

Woods Bagot: What do you believe are the key issues to drive sustainable built environments?

Paul Edwards: There are a couple of things. Firstly there is a market for it. Tenants are now requesting sustainable buildings with good indoor environment quality and low energy to meet their corporate responsibility targets. The big picture is the need for planetary change and the way we use the natural resources of the environment. We only have one planet and we won't be able to continue living if we're not careful.

WB: Is the extent of the green, sustainable movement the same in retail as it is in the commercial sector?

PE: I think in some ways it's further ahead. If we look at our big retail clients like Marks & Spencer and John Lewis and Partners, they are ploughing ahead. They both have sustainable policies that we are asked to follow that include renewables, material selection, EMF plans, transportation plans, right down to every aspect of sustainability. Marks & Spencer have a program that they call Plan A, there is no Plan B. It sets out 100 commitments over five years to address the key social and environmental challenges they face. They plan to be carbon neutral by 2012 and they are spending £200 million to get there. Tesco has 100 million to spend on renewables in the next two years and they've gone out scouring the world for the very best in renewables. McDonald's have started to recycle their fats in order to power their vehicles. The next tier down from the bigger players, the smaller tenants, the one offs, they're not quite there yet so there is a big difference.

WB: Having worked extensively in Australia, what is your perception of retailers' adoption of sustainability in this region?

PE: When I was in Australia, I think Coles had set up internal groups on water waste; they did good work on plastic bags, which has become law in the UK to ban plastic bags by 2010. There is probably more capital to invest in sustainability here and more emphasis, particularly as the big players like Marks & Spencer are at the top of the chain and shouting about it. Boots is doing the same; we have a meeting with them this week to discuss a low carbon store.

WB: How effective do you think we have been in developing a truly sustainable environment?

PE: One of the issues in the UK is that sustainability is generally termed as 'carbon' which is frustrating as true sustainability includes material selection and transportation but it's also about community: skills, job creation, satisfaction. I don't think there are many holistic examples around the world.

Here in the UK, Hammerson specialises in regenerating town centres. We don't build monolithic shopping centres any more. We are integrating communities back into the city which gives them vibrancy and security but at the same time we have programs to develop skills of the community. One of the programs involved a bus trip around the local community to tell the homeless and less privileged about which jobs were available. We had 3500 jobs and we tied them with skills training for people with no previous retail experience. We filled seventy-six per cent of those jobs with people who were unemployed which I think is a magnificent achievement and we are doing that now in all of our centres.

There is a lot more push for true sustainability as people become more aware of what it means. I think the biggest problem is a lack of consistency and information. So if you're a tenant you're not sure what you should be asking for. If you are a customer in the street you're not sure what you should be doing personally or what you should be asking from your stores to do. Education and information transfer needs to happen if we are going to demonstrate a true built environment.

WB: How do you see some of these sustainable solutions operating in the buildings of tomorrow?

PE: I think ironically there are two key focus streams. One is to almost revert back to ancient days. I know we didn't have computers but we used to have buildings that kept cool. The Romans used to have fountains in the middle of courtyards, massive means of conditioning the air such as thermal mass and natural ventilation, opening windows rather than artificially air conditioning spaces. Some of those solutions today aren't applicable to every outcome. Data centres for example, you'll never cool them by only using thermal mass but then you look to the extreme of technology, changing materials, and the new solutions that are coming through, and there are possibilities.

Paul represented Australia at the Asia Pacific Partnership for Climate and Clean Development and was awarded Future Leader by AIRAH in 2003. At Hammerson he is now integrating sustainability into a £5b pipeline including five new town centres and a £7.5b existing asset portfolio. Hammerson will open the first BREEAM 'Excellent' retail project this year at Bristol and is part of the new BREEAM 'Outstanding' pilot with BRE. Hammerson is also a founding member of the UKGBC.

There's a brilliant piece of work by Janine Benyus based on a subject called Bio-mimicry, whereby one learns from the lessons of nature. For example, look at a tree and see how it continually grows, it can pump water forty metres into the air, it creates energy, it photosynthesises, it's a magnificent piece of natural engineering. If we could mimic that in our systems then there would be no waste, everything is reused by nature, it has a positive impact on the planet. I think these are the sort of extremes we are going to have to go to. You can now get 13 mm walls that change phase to represent a thermal mass of 150 mm concrete so there are magnificent scientific moves and technologies that will help us all. It's whether they come quick enough.

WB: There's a huge impetus and if you look at the rate of change that's currently happening it's phenomenal. What other radical ideas have you heard of?

PE: I tell you what would be an idea, if someone would actually set a vision statement for the country. What would England actually look like in 2050 at 80% below where it is today on carbon emissions? What does it look like in 2020 when we've got no land fill anymore in the UK? Let's understand what we should be aiming for here. Is it in the area of mass wind turbines off the coast of England or is it individual turbines on top of everyone's house? Once we understand that then the radical ideas are actually the implementation mechanisms. Germany has an amazing mechanism where they have a self funding photovoltaic market which means that they are now the largest users of photovoltaics anywhere in the world. This has enabled them to develop the technology further. How did they do it? There needs to be some smart thinking about how we can finance these initiatives besides through taxation.

Interview ends

Marks & Spencer have a program that they call Plan A...



there is no Plan B.



Dr Gisela Loehlein is an architectural engineer by training and holds a PhD from the Welsh School of Architecture. She is currently pursuing a second PhD in urban design from the City and Regional Planning Department, Cardiff University. Gisela has held research/teaching positions at Fraunhofer Research Institute in Germany, School of Architecture and Design at Victoria University in Wellington, New Zealand and the School of Architecture and Design at the American University in Sharjah and the British University in Dubai, the Institute of the Built Environment, which is linked to Cardiff University.

Interview with Gisela Loehlein

Woods Bagot: How much is sustainability on the agenda in the Middle East?

Gisela Loehlein: Initially I was told that I would be crazy to come here if it was in order to push for sustainability, it is not possible, there isn't the interest or the attitude. It has been an issue of how to balance the economic boom and fast pace development with emerging technologies and sustainable building design. The industry worldwide is only finding its feet and many materials and services do not have the capacity for the construction demand required in Dubai. The challenge is certainly about how we can prepare the market for sustainability whilst maintaining our rate of development, and I think the industry is becoming more open to it now. It's a process, because we don't become environmental designers overnight, and specifically not here because there's no textbook on sustainable design for an arid climate. Most of the environmental thinking comes from moderate climates, it comes from the West.

WB: What leading examples of sustainable ideas or design do you know of, or you think are leading the way?

GL: The photovoltaics market is interesting and they are currently running tests to actually see which products work here in the desert. The other interest of mine is nanotechnology, which is the equivalent of genetic modification in the organic world. The impressive thing is that you can program materials to grow, to heal themselves, to have different properties so that when the sun shines onto something like glass it actually gets darker, etc. Nissan has brought out a car that you can scratch and it heals itself in two weeks. There are a lot of developments and innovations but rarely directly for the built environment. We haven't got the funding body for R & D. We have to learn what's occurring in the space, medical and military fields and apply it to the built environment.

WB: What good examples have you seen of sustainable design?

GL: Zurich Airport in Switzerland is a good passive, integrated example. You actually have to be sitting in there for awhile to realise that it is a sustainable building and I think this is the new phase that the West is bringing us, much more integrated systems. You sit in there and look around and then realise the whole building has no air conditioning. It's all dealt with—a completely sustainable building. All the shading devices simultaneously produce electricity due to the PV cells.

Photovoltaics are still used a bit as an ornament—a sort of shouting out signifying that I am green. And the return on investment is not immediate. They can take ten years to pay back. Whereas using solar thermal to capture heat to use or convert to energy works much better and it's a 1–2 year payback period.

Another good project is in Bahrain which passively cools the outside market retail area. The brief was to allow people to walk and mingle for longer periods of time outside without active thermal assistance, utilising a series of landscaping filters, water cooling systems and cooling towers. The design drags in, traps and expels air at different stages and makes use of the daytime and night time wind direction to cool the structure down. It provided an extra two months when shoppers could be outside.

WB: What do you see are the risks for sustainable development?

GL: The huge learning curve and attempting to apply this knowledge immediately. The Dubai International Finance Centre is going to have a tower that will be close to zero carbon. They are trying to put all the different gadgetry and tricks of the trade into it to try and make it work. But like everything, learning is a step by step process by focusing on applications and implications of one technology at a time. How do solar thermals work? How do photovoltaics work on a large scale structure? How efficient are they, and where are they the most efficiently used? The opportunity to design truly hybrid buildings is rare, to immediately put everything onto one building if you don't have the experience is a risk therefore interdisciplinary teamwork and research-industry collaboration are required in these instances.

WB: Over the past two years there has been a global explosion of awareness of climate change and the contribution our built environment makes to same. This has resulted in a rush to have buildings certified as 'green'. How is this operating in the UAE?

GL: We need to start somewhere on it and the West started with guidelines. I suppose it is to set a standard and make the process idiot proof, but at the same time these Excel sheets can limit your innovation as a designer or engineer. There is a risk it becomes a tick the box exercise and that's it. LEED is currently being used in the Middle East for benchmarking, but for it to be appropriate it needs to be adapted to fit our culture and climate.

Ultimately I hope we can grow out of using guidelines and minimum standards. They are limiting because you cannot measure social integration and real economic impact, the other aspects of sustainability. I think certification is the starting point, but ultimately just by raising up the numbers you don't necessarily get better quality buildings.

She was the Principal Sustainability Research Fellow for ATKINS, Middle East. Currently she holds the Consultant position to the Director General, Sheikh Khaled Bin Saar Al Qassimi, for the Directorate of Public Works, UAE.

WB: Given that buildings might last fifty years on average, what do you think may be the way that we can future proof them?

GL: Creating adaptable buildings would have real potential. In other words the building itself adapts to its own needs, so that the envelope becomes like an actual skin. Whether it's winter, summer, daytime, night time, the building responds. However, it's dangerous to sweep in from the West to eastern countries and have an imperialistic view of sustainability even if it's normal to do that because we were told that our western thinking is superior. But if you start by actually developing your own local system, a global and local combination, you get much better adapted, meaningful solutions, that actually in turn are informative for the West.

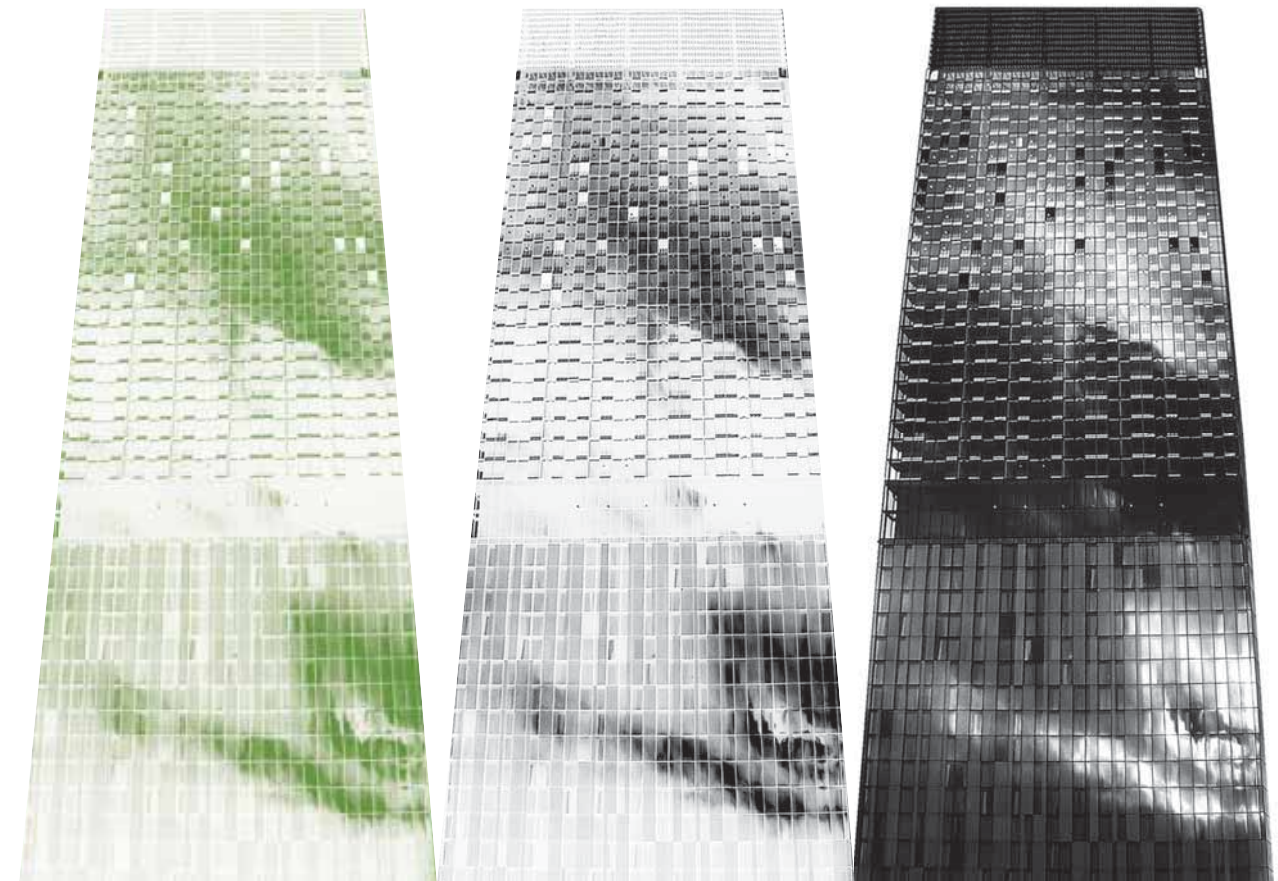
WB: Our response to environmental destruction has so far been to be 'less bad' such as programs encouraging reduce, avoid, minimise, sustain, limit, halt...etc. Do you believe such thinking will continue to prevail or do you think that there is an opportunity for new thinking that views the earth as a biological system that we can fit into, that buildings can contribute to their environment as trees contribute to the earth?

GL: We've got a project in Abu Dhabi where we produce more energy than we can use in the building, and when we told our client he said 'Oh great, we'll cool the car-parking'—it's the wrong approach. We convinced him to feed the energy back into the grid as a social gesture. Currently we are working on buildings that will only need ten per cent of the current electricity demand and hopefully in the future we are able to feed into the grid rather than take from it.

And if it's possible anywhere, it's here, because we've got fantastic climatic conditions, the sun and the daylight out here, you couldn't wish for better daylight. It's crazy that nearly every office has to have electric lighting on because they're badly designed. We've got fantastic heat, which can be harnessed. If we can save the environment anywhere we should be able to do it here. It's free. And it's much better than having to struggle in somewhere like Scandinavia putting up solar cells and having very little daylight, particularly in the winter. We are not hampered by guidelines and that is something. The flexibility that we have we take for granted and we don't really maximise what we could do with it. That's up to us as individuals, practitioners, academics and clients.

Interview ends

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Professor Rob John Adams AM B.Arch (Cape Town), MA.CNNA (Urban Design Oxford), FRAIA, HFRAPI, is the Director of Design and Urban Environment at the City of Melbourne. He has over thirty-six years experience as a practising architect and urban designer. In his role at the City of Melbourne he has produced a prolonged and consistent output of design-based urban projects and strategies worthy of over 100 state and national awards for excellence.

Interview with Rob Adams

Woods Bagot: How successful do you think we have currently been with the solutions we're putting in place dealing with sustainability issues?

Rob Adams: What I think is dawning on a lot of us is that the solutions have always been there, and arguably if we go back 70–100 years and actually look at people in different climatic areas, we're dealing with solutions that already existed before we started to put in modern technology. We should be starting to design buildings that are appropriate for the climate of our cities. I think this is going to be the big challenge. We'll go backwards first to go forwards. This is evident in Melbourne's CH2 building. The most effective factor in the building is that we can open the windows at night to allow the building to cool down and that single action saves 20% energy. As a profession we are going to have to get away from the seduction of technology and start looking more carefully at realistic solutions that adapt our buildings for the climate.

WB: Is there a city that you think is leading the way with these considerations?

RA: If you asked me to pick a city where we can achieve zero emissions in five years, I'd pick a city like Barcelona and there are others similar. The reason is the density—200 people per hectare—the highest density of any city in Europe. It has great streets, it has wide footpaths and public transport, it's walkable, it's mixed use so you don't have to go too far to find anything and it's only built to seven storeys so the whole roof of the city can become a solar collector. It was designed pre-motor car as a walkable city. A lot of other cities have these conditions as well. We just have to rediscover them.

WB: Yes, Barcelona has been quoted as one of the 'smart cities'. Do you believe the trend towards zero carbon cities and buildings should continue?

RA: I do, and the interesting thing is that it's not a hairshirt future—we don't have to give up a lot to achieve this goal. Ironically a lot of city changes or adaptations in terms of liveability are identical to those needed for sustainability. We will find that cities of the future are far more exciting places to be in, far more socially and environmentally attuned. From a professional point of view I get quite excited about the challenges we are being set and I keep on wanting to say, 'Let's stop avoiding this issue; the solutions are quite exciting'. But we also need to insist on courage in government focus.

WB: The rate of change in the industry has been fascinating; what do you think about refurbishing existing stock to be more sustainable?

RA: What the Clinton Foundation and their Energy Efficiency Building Retrofit Program is doing for C-grade commercial office buildings is fascinating. The program allows both cities and building owners to apply for the necessary funds to retrofit existing buildings with more energy efficient products.

WB: Are you aware about how much uptake there's been with this?

RA: Yes. Two cities have signed up to it, London and Melbourne. In Melbourne we have given them our total city property portfolio to review. The state government has also committed a part of the parliamentary precinct. When addressing a city rather than a single building we can achieve economies of scale on factors such as blackwater treatment and co-generation. As yet I don't know of any built examples but the momentum is growing and the process has begun.

WB: So where do you think the focus needs to be, on future proofing new stock or re-visiting our existing buildings?

RA: We are going through that exercise as we speak. We've done a feasibility study on a C-grade building. It was built to low commercial parameters, low floor to ceiling heights and so on. It will cost us about A\$43 million to convert it to a 6 Star building. To knock that building down and build a new 6 Star building of the same size would cost A\$53 million. It's a no-brainer which way we should go.

WB: Absolutely. What are the most radical ideas you have heard about in terms of sustainable solutions?

RA: There are some interesting ideas. Take the Melbourne example of harnessing the energy of water. A lot of people may not know that the water level between the bay and the sea during the changing of tides is one metre. It is a huge force that comes through the heads. They are now looking at generating electricity by harnessing that force. I think this will be an area of focus more and more with the rise of tides.

The funny thing about this whole debate—even the building of cities—none of it is new stuff. People talk about CH2 as something radical and I hear, "Look at the solutions—it's got opening windows, it's got flyscreens on the windows when they open at night, we have plants in the building and we protect our windows on the north". Well that all sounds like pretty common sense stuff to me.

Rob is a passionate believer in the good design of cities and the important role to be played by all levels of government. A champion of the arts and environmental sustainability, he has worked to ensure that good urban design is established as a platform for city development into the twenty-first century. In 2007 Rob was awarded an Order of Australia (AM) in recognition for services to urban design, town planning and architecture.

WB: Getting back to cities, do you think the model for our cities of the future will become more village-like in the way they are planned, so that everything will be much more localised? Or do you think the current model will be maintained?

RA: I think if you take the typical Australian city it will become more village-like. Suburbia will be redefined. In a hundred years time we will have clusters of very dense, almost central city developments in and around our community and railway stations. We will have high density corridors along all our public transport routes. When you drop off the dry cleaning, get a cup of coffee and do your market shop, it is only going to be a couple of kilometres from where you live and you'll mostly do it increasingly by walking or taking a bike. If you're going to do a big market shop it might take one of those delivery bikes that ride around Copenhagen. Energy will be saved and personal fitness will increase.

But the car will still be there. The car will become that element you use for a special occasion, like the old carriage that used to be brought out for a special occasion. For a lot of people, and I have lived in suburbia, that will be a huge relief because living in suburbia you have to drive sometimes 16 kms to get to anything that's worth visiting. I think this is going to begin to change quite quickly. This idea is at the base of Melbourne's 2030 and Brisbane's Southeast Development schemes—developments with high density in and around the transport infrastructure. There is a way to resolve our problems and we have to start doing something about it fairly quickly.

Interview ends

A lot of city changes or adaptations in terms of liveability are identical to those needed for sustainability.





Interview with James Evans

Woods Bagot: How effective do you believe our current attempts to develop truly sustainable built environments are?

James Evans: It's a reasonable start; I would rate it four out of ten. Far greater emphasis and research is required to improve the existing building stock. A lot of focus is on new buildings but they represent such a small percentage of our built environment. I think initiatives, particularly tax benefits and penalties and government incentives, don't exist in sufficient quantities to encourage building owners to improve their existing assets.

WB: What does the future look like for our built environments?

JE: Boldly I would say by 2030 new buildings should all have near zero energy use and near zero waste. By 2060 we should actually be contributing positively back to the bigger picture of the environment.

WB: What is the most radical idea that you have come across for sustainability?

JE: I'm still hanging on to nuclear fusion. Obviously there are enormous benefits in it. It's been around for many years but actually making it work is what would be radical.

It's also interesting to contemplate the 'Dark Green' movement. Part of that philosophy suggests man should return to being a 'nil user' and actually contribute back to the environment. Dark Green supporters are opposed to Maglev train technology for example, which on the face of it appears to be a very efficient use of energy, but the argument is that such technology makes transportation so much easier and quicker for man which in turn leads to further consumption of resources and expansion of man's footprint. It is an extreme view, but is worth contemplating. Our resource consumption needs to be significantly reduced.

WB: How do we ensure that we future proof buildings in environmental terms?

JE: Firstly, building services flexibility, and secondly, mandated sinking funds for service replacement are needed. How do we predict what the technology of the future will be? As technology improves, a building must have a substantial sinking fund on which to draw in order to pay for updated services.

James has held senior management positions in the property development and construction industries, primarily in Melbourne, over a period of more than twenty-six years. Specific roles have included state manager, development manager, project manager and business development manager for Devine Ltd, ING Real Estate Development, one of the world's largest and most successful urban property developers, and Multiplex, one of Australia's largest and most successful property development and design and construct contractors.

Many of the projects he has been involved in have been large-scale mixed use developments including Waterfront City (Melbourne Docklands), QV (Melbourne CBD) and the Como Centre (South Yarra, Melbourne).

WB: Where do you believe our efforts need to be focused in order to address shortcomings in our current approach to solutions?

JE: We have renewed awareness but I don't think we have the depth of understanding at the moment. I would like to see a diversion of the debate away from whether climate change is part of a natural phenomenon or whether man is contributing in whole or part to it, to an acceptance that man has limited resources and that those who only look at one or two generations ahead need to be financially penalised. From my perspective it's time wasting to determine to what extent man has contributed to global warming or climate change—the fact is there are limited resources—that is unquestionable—and therefore education, business and government should all target this issue rather than spending time and resources debating amongst ourselves who or what is to blame. So much of our time and effort goes into debating as opposed to accepting and doing.

WB: Are there good examples of current initiatives or solutions that you believe set a benchmark for how we should move forward?

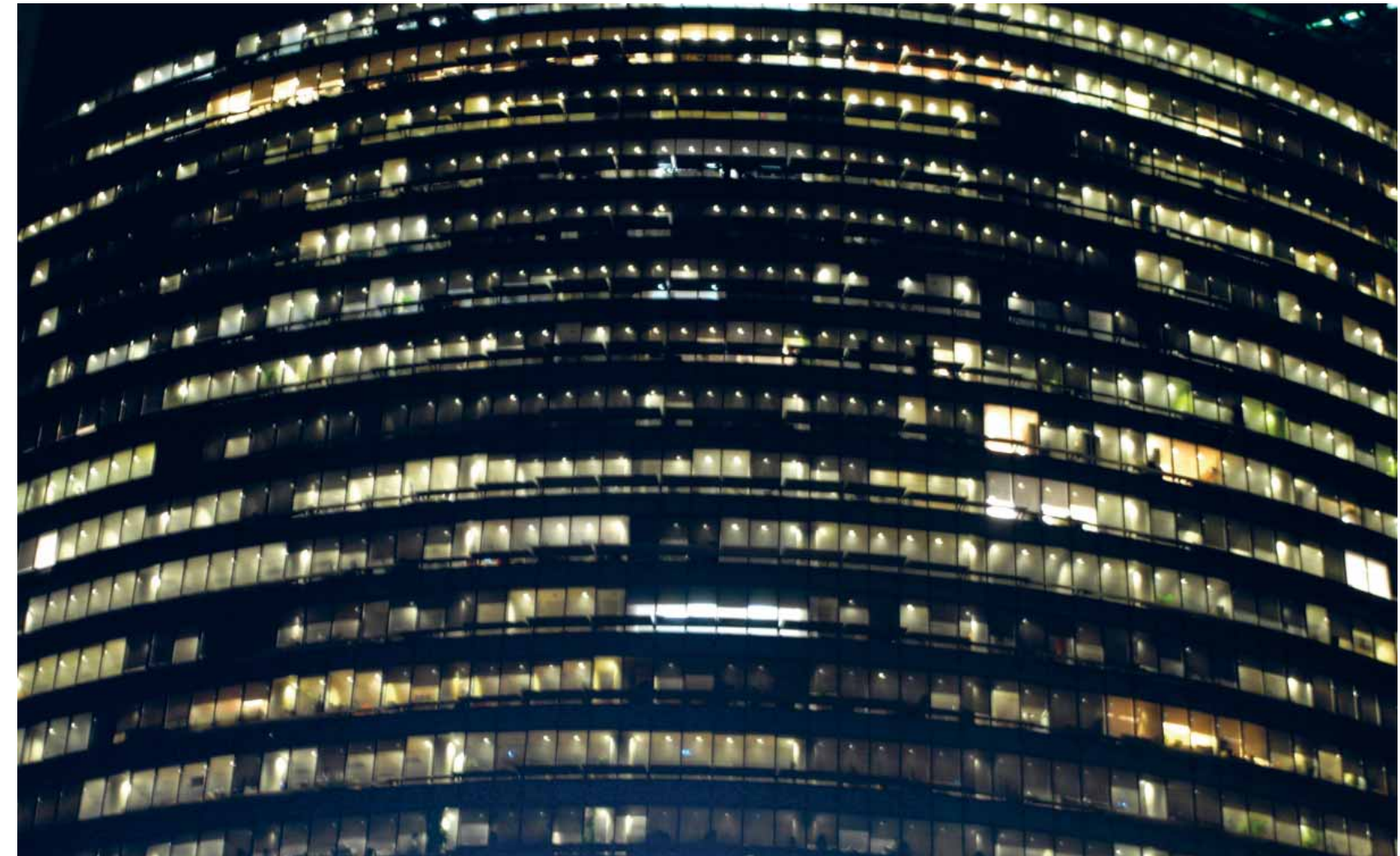
JE: I feel sceptical. We're not there yet. The current advanced leading buildings still have a long way to go, but they represent a reasonable beginning. In these early days business cases are often still based on less tangible benefits, benefits to productivity, that sort of thing.

We must continually scrutinise. Many are jumping on the bandwagon with some part solutions. For example, we are getting rid of existing tungsten lights for new energy efficient globes, but they too are full of embodied energy and may cause more harm than good. Perhaps part of the solution is simple; turn off some of your new light bulbs. As I often argue with my wife, "don't turn the heating on, put on something warmer".

We need to look at ourselves and our ever-expanding expectations not just our built environment.

Interview ends

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Alan Findlater is managing director of Donald Cant Watts Corke Management (DCWC) with over twenty years industry experience with firms, Leighton Contractors and Lend Lease. Founded in 1966, DCWC provide a full range of project management services from initial optimisation studies through to strategic management of property assets. They have worked on a wide variety of high-end projects including Parliament House and the National Museum of Australia.

Interview with Alan Findlater

Woods Bagot: How effective do you think we have been in our current attempts to develop a truly sustainable environment?

Alan Findlater: I think it's probably too early to tell and it's also a difficult thing to measure. What has been most effective is the amount of change within the last three years. If your buildings are not rated Five Star Green Star then you're not considered to be doing anything special. This is a huge shift.

However, it does seem a lot is being driven by accreditation points. The industry has created a rating tool but is that giving us what we actually want? This means people's behaviour is directly linked to how they're measurable. It's arguable whether we are pursuing the best outcomes, or are simply pursuing points. I don't necessarily think it's that easy for any kind of system of points to necessarily drive the behaviour you want. In my experience being driven by points can steer you away from what is intuitively a better outcome. However, the label of an accredited building seems to be gaining importance. Every project will be different of course.

WB: Is there a future for the green building councils?

AF: I think so. But they will need to ensure they maintain their relevance. If there was a marked trend away from points then it would indicate the need for realignment. The whole process is one of change and evolution.

I think the ESD consulting profession will need to continue to evolve. In this initial phase it's almost like a bit of a crusade—the whole movement is bound in sustainable principles and there's a certain esoteric element to it all. A lot of that will go through an evolution and there will be a more pragmatic approach going forward.

WB: Have you come across some radical ideas that you think should be investigated further?

AF: We're looking at a project at the moment with wind power turbines. It's unproven whether it will deliver the end results but we have a client who is interested in pursuing it so we're open to new ideas and different approaches. It's a bit of a laboratory out there at the moment.

WB: You spoke earlier about outcomes versus points systems. Are you seeing a movement towards carbon neutral buildings?

AF: Yes we have clients where this is a key stated objective. The perception of the benefits is driving the need. The market is asking, 'Are you building carbon neutral?', and people want to be able to say yes.

WB: What does the future look like for the built environment? What sort of sustainable solutions do you think are going to be a feature for the buildings of tomorrow?

AF: To be positive I would say the industry has a great capacity to be innovative and is open to change. The big institutions are all taking it pretty seriously and looking at their building stock and how they are going to improve their ratings. The market will show a great capacity to respond despite some trial and error. Probably in another twenty-four months there will be a shakeout of all the options and certain strategies will be pursued more vigorously in a targeted way.

WB: What about future proofing? Are these assets going to be around for 40–50 more years in an environment that is changing quickly?

AF: Very difficult to answer. One of the largest influences is how much you can afford to future proof in the first place. It means recognising that the building will be obsolete in twenty years. Does future proofing mean having a core structure that is capable of different uses? Or is it ensuring that the completed built form can last through different or longer cycles? It's difficult to predict because no-one knows where science is going. You can spend a lot of money on future proofing and get it wrong.

Interview ends

One of the largest influences is how much you can afford to future proof in the first place. It means recognising that the building will be obsolete in twenty years.



The future of sustainability

References

Snushall, P., Cronin, S., Spencer, J. & Cameron, S. (2005, December). *Green property: Does it pay?* Report for the United Nations Sustainability Project. Merrill Lynch.

Image credits

Building lights: Mark Marin

Obsolete building: Hannah Gonzalez