

YEARBOOK 2014

uponor

Diversified needs set new standards  
for the built environment



People



Business

# Foreword

This Yearbook focuses on *change* – a theme that is always topical. Many books have been written about change. Change is everywhere, yet managing it is difficult.

Organisations implement systems and processes to support change, but change only occurs when the people in the organisation adopt it. The same applies for business. Businesses will change if their customer demands are changing or competition, regulation etc. is imposing new demands on them.

Somebody always needs to take the initiative, point the way.

Throughout its history, Uponor has been an advocate for change. Uponor's core purpose states that we *partner with professionals to create better human environments*. The statement starts with a *how to do it* part and ends in a *for what purpose* part. For me, the interesting part is in the middle, the word *better*. That single word in comparative form crystallises what we believe in and shows our ambition to change things for the better.

While being an inspiring statement for our employees (*we are building a church, not just laying bricks*), the core purpose statement is dynamic as it invites everyone in our industry to join forces on the road towards better and more sustainable human environments.

Uponor cannot do it alone (no matter how superior plumbing, indoor climate or infrastructure solutions we make) so we need to partner with other building industry professionals to achieve real and meaningful change.

This Yearbook 2014 is one of our efforts to share our mission and vision and create sparks in our employees', partners', customers' and shareholders' minds to innovate new and faster ways to reach our target: better human environments. Glance through or read some of the stories to discover what keeps us busy in different parts of the world.

Thanks for joining us on this journey!

Tarmo Anttila  
Vice President, Communications

PS This is our second Yearbook, greatly enthused by the positive feedback we received on Yearbook 2012. As always, we welcome any feedback, ideas and comments. You can send them to: [communications@uponor.com](mailto:communications@uponor.com) or directly to me. Who knows, we may use them as a source of inspiration as we develop our next Yearbook – unless of course we think of something new by then!



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# Changes in the needs and demands of people

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In the past decade the number of urban areas of more than 5 million people has increased

**by 50%**

population

**7**

billion

As the world's population hits the 7 billion mark, more than half of us live in cities.

By 2050 almost

**3/4**

of the planet's population will be urban.



Worldwide  
mobile worker  
population  
is estimated to  
increase from  
just over 1 billion in  
2010 to more than  
**1.3 billion**  
by 2015.

Aging population, urbanisation and changes in lifestyle are impacting the way we live and work. Needs and demands regarding better human environments are diversifying faster than ever. Technology enables things we could not even imagine before and, at the same time, there is a growing need for sustainability in homes and workplaces alike.

# BRIGHT LIGHTS, BIG CITY

People are the most valuable resource shaping the future of cities, which is where the majority of the world's population will live within two decades. Contrary to popular belief, urbanisation is good news for built environments and those who live in them.

There's an often-repeated adage that life was easier and simpler in the past. Yet the reality is that despite all the technological advances that we've made, our basic needs about what constitutes a beneficial living environment – good shelter, healthy food, safety, and easy access to public services – have not radically changed in thousands of years. Already during the reign of Emperor Augustus (62 BC to 14 AD), founder of the Roman Empire, there was a focus on the importance of quality of life and public services.

The Romans built their aqueducts for transporting clean water into the city more than two thousand years ago, with the earliest one Aqua Appia being built in 312 BC.

With growing urbanisation, cities around the world are becoming larger in terms of physical size and population. Naturally the supporting systems in terms of infrastructure are also becoming increasingly complex. For example, if the appropriate systems are not in place to take away excess water, flooding can become a big problem as has been witnessed in the international news recently.

"People's basic needs haven't changed over time, but the understanding of what is possible has changed," says **ILKKA HALAVA**, one of Finland's leading futurists and foresight coaches.

One of those possibilities is the city, which is where more and more of the world's population will be living in the future.

Professor **STEVE RAYNER**, heading Oxford University's Programme for the Future of Cities, often speaks in favour of the city.

"We're in the middle of the greatest migration in history, that's the migration of the rural population to cities. We've already passed the point where we have 50 per cent of the world's population living in urban areas and we're well on track in the next couple of decades to reach 70 per cent.

"The urban density and concentration of intellectual and creative resources and talent in the city makes them the real hubs of innovation and creativity."

## Cities that were once considered to be concrete jungles are developing into green communities

According to Rayner, it's often erroneously thought that cities make people poor and that they're not beneficial to the environment. "It's in cities that poor people get to be rich, [cities] are also the key to improved human health and I would argue that they're really good for the environment. There's a misconception that cities are places where you have increased pollution, environmental degradation. The per capita burden that city dwellers put on the environment is in fact lower than the per capita burden put on the environment by people living in the countryside."

Cities that were once considered to be concrete jungles are developing into green communities that can protect, maintain and even restore natural environments if concerted efforts are made to reduce the human footprint.

"Humans tend to focus on surface issues, such as how recreational areas are designed or how comfortable our living environments are. But we should dig deeper. Aging infrastructure is one of our biggest challenges, but it's also a great opportunity to reach a more sustainable future. By developing the infrastructure, we can reduce the human impact on nature – which especially in high-density city areas should be a priority. At the same time we can upgrade the infrastructure

to meet current demands and help us prepare for more extreme weather conditions," says **MAGNUS LUNDIN**, Executive Vice President, Offering and Development at the company's new infrastructure solutions arm with businesses in Northern Europe, Canada and Asia.

## Drivers of change

According to Halava, there are several factors that affect future living environments that start with the human being.

"People are living longer. Of those children who are currently under five years of age in Finland, every second one will live to be 100 years old. As a result, our lifestyles are changing," he says.

"Another important factor is how human capital is extended. We're currently talking about extending the retirement age by a year or two,

“People’s basic needs haven’t changed over time, but the understanding of what is possible has changed.”

## AGING POPULATION

Over the next 40 years, the amount of people over 60 years will increase by

+30%

### TRENDS THAT WILL INFLUENCE FUTURE LIVING ENVIRONMENTS

- The next consumer is the super consumer who understands his/her own power and knows how to organise like-minded folk into active groups. For example, when a group of seniors was dissatisfied with retirement home options, they organised themselves into a group and set up and built a seniors’ home that met their needs and demands. This type of co-creation is a strong signal of the future and one that should be paid attention to.
- Customisation of built environments aided by digitalisation; for example, 3D printing enables individuals to produce items for their own environment.
- An increase in free urban public spaces open to everyone, a localised version adapted to local climates of the piazzas found in Southern Europe where people gather together.

- Different funding solutions and ways of building: for example, in an apartment building, having shared spaces such as the top floor devoted to a large living room or greenhouse for all the building’s residents. These solutions require a new kind of community thinking, which is already underway.

Source: Futurist Ilkka Halava



**ILKKA HALAVA**  
Futurist  
Foresight Coach  
Producer at Prime Frontier Oy  
& Future Works Oy





but in the future that extension may be much longer and people may be working [because they want to and are in good health] part-time well into their 80s or 90s,” explains Halava.

All of these so-called human changes will affect our built living environments, from how they are built to what their necessary functions and purposes will be.

“Whether people are living in a city or a non-urban area, the requirements are basically the same: functional, low-maintenance, self-controlled systems that make life comfortable,” says **ESA HIRVONEN**, Head of Uponor’s R&D.

Worldwide, consumers are putting more and more focus on ecological issues, which they can influence by their own choices. According to a recent McGraw-Hill construction report, client demand is the primary trigger in driving green-building initiatives in Europe and the U.S. Other reasons stated in the report were corporate customer commitment and operational cost benefits.

“We are continuously developing solutions and technologies to fulfil these needs, as well as the day-to-day demands of people for their built living environments. We do have a strong track record, but we must also continue paying attention to what’s happening out there and what our customers want,” says Hirvonen.



1800

2%

living in  
urban  
areas

1950

30%

living in  
urban  
areas

2000

population  
7 billion

47%

living in  
urban  
areas

2050

75%

of  
population  
will be  
living  
in urban  
areas

Today, spaces in most office buildings are on average only 35-60 per cent occupied at any given time



# BETTER URBAN LIVING

Many factors comprise a good living environment. Residents of three different cities – Copenhagen in Denmark, Vancouver in Canada, and Shenzhen in China – share what makes their neighbourhoods work.

**T**he Monocle Most Livable City Index, which has been published by the lifestyle magazine since 2007, annually selects its 25 top locations. “The metrics are a mix of the scientific and subjective and consider everything from public safety, flight connections, tolerance, cultural outlets and 30 other parameters,” writes **TYLER BRÛLÉ**, Monocle’s Editor in Chief, in a recent *Financial Times* column on the survey. Monocle’s index takes into account also public transportation, environmental issues, urban design, business conditions and pro-active policy developments. Copenhagen tops the 2013 list, with Melbourne, Helsinki, Tokyo, Vienna, Zürich, Stockholm, Munich, Sydney and Auckland rounding out the top ten positions respectively.

## Diverse Vancouver

**JENNIFER GRAY-GRANT** lives in Vancouver, Canada’s most ethnically and linguistically diverse city, with her husband and two teenagers. Nestled on the West Coast, Vancouver is often called one of the most beautiful cities in the world and lauded for its quality of life and dramatic backdrop of mountains and ocean. Yet its real estate is among the most expensive in the world.

Gray-Grant lives in a housing co-op, which keeps the cost of living reasonable, in the Renfrew-Collingwood neighbourhood.

“We’ve lived in this housing co-op for the past 20 years and there’s a real sense of community. It’s a safe environment and everyone knows each other and looks out for each other,” she says.

Gray-Grant, like Fensholm, says that she’s very happy with her living environment because her needs are met: it’s safe, the distances to work and grocery stores are short, and there are excellent schools for her children nearby.

Gray-Grant is the Executive Director of the Collingwood Neighborhood House. The House has a local hiring policy, which means that 50 per cent of the staff lives nearby, including Gray-Grant. “I walk to work because I can,” she says.



## Cool Copenhagen

According to Monocle, the Danish capital is the world's most livable city: "World-conquering urban quality of life requires the trickiest of balancing acts between progress and preservation, stimulation and security, global and local. Perfection is unobtainable but Copenhagen is striking one of the best deals right now."

**ANDREAS FENSHOLM** lives in a small house about 15 kilometres from the centre of Copenhagen with his wife and three kids.

"I am very happy with where I live: a small house with my own garden, lots of green areas and many recreational facilities and sports clubs nearby," says Fensholm, who works as a special adviser in the Department of Economics at the University of Copenhagen.

"A good living environment for me means convenience, safety and space. I moved out of the city centre to have more space for my children as well as short distances and safe roads to schools and kindergarten," says Fensholm.

"Even though it is a pretty big city, Copenhagen doesn't feel that way when you are here."

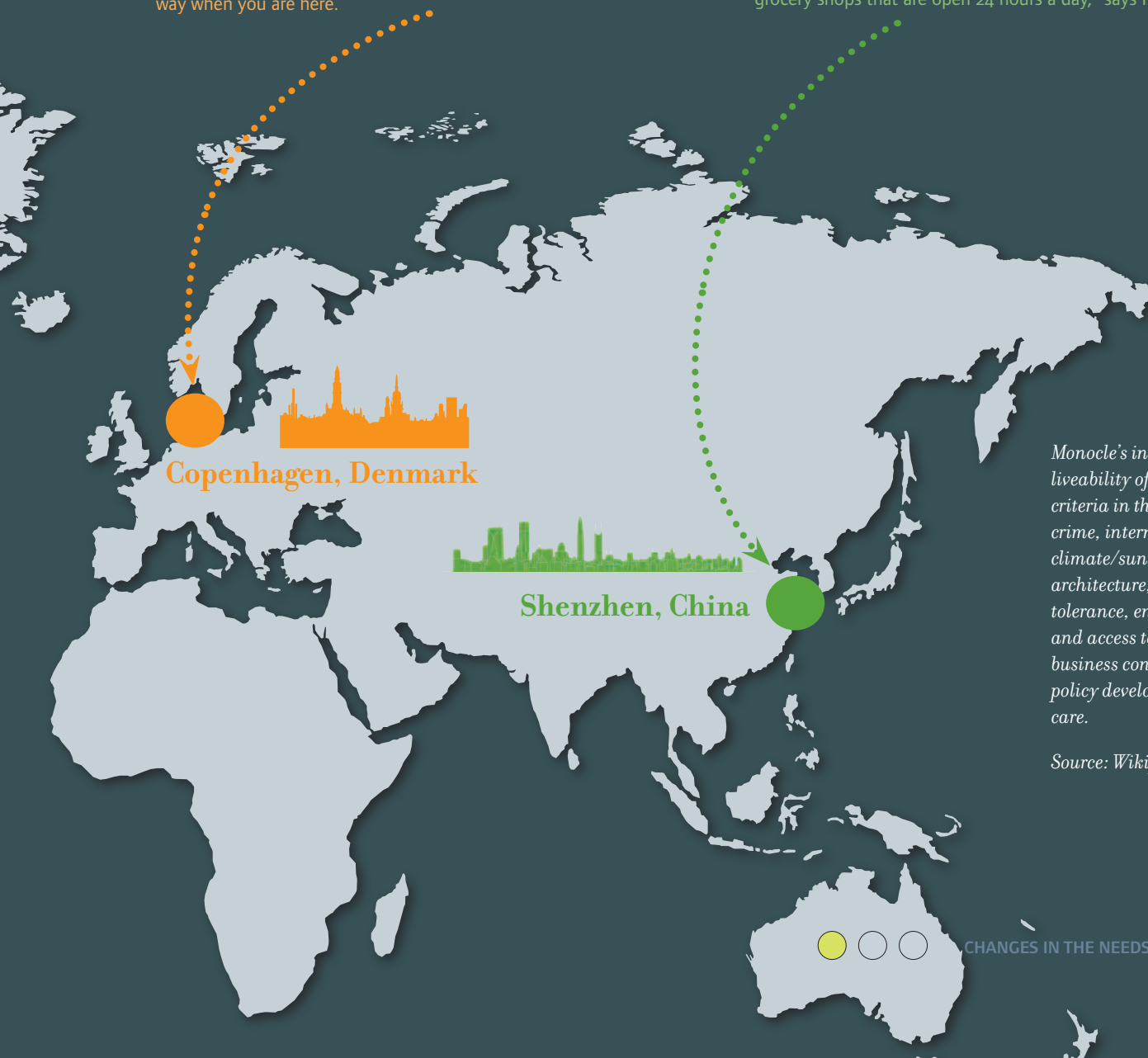
## Super Shenzhen

Close to Hong Kong, Shenzhen is one of the world's fastest growing cities with a population of 15 million people. The first and most successful of China's Special Economic Zones, it has enjoyed rapid foreign investment during the last three decades, with numerous high-tech companies headquartered here and a growing international community.

**TUOMAS HARJUMAASKOLA** and his wife **MIAO LIU** recently moved to the Shekou area of the city and are pleased with their new home. The location is excellent for Harjumaaskola, a photographer and creative director, who travels extensively for work.

"It takes about an hour – door-to-door – to travel from our home to the Hong Kong airport, which has excellent flight connections to about 165 destinations around the world," he says.

They live in a spacious three-bedroom apartment that is part of a massive block of thousands of flats tucked in between the traditional Chinese part of the city and its more Western part. "It's very safe and all of the essential services are nearby, including several big food stores and grocery shops that are open 24 hours a day," says Harjumaaskola.



Copenhagen, Denmark

Shenzhen, China

*Monocle's index measures the liveability of cities. Important criteria in this survey are safety/crime, international connectivity, climate/sunshine, quality of architecture, public transportation, tolerance, environmental issues and access to nature, urban design, business conditions, pro-active policy developments and medical care.*

*Source: Wikipedia*

# WHAT'S NEW @ THE OFFICE

Workspaces should be designed with a sound understanding of how people really go about their work – not for the obsolete practices of a bygone era.

**D**igital technology has liberated work from being bound to any particular time and place, yet many offices are still designed as if we were chained to our desks from nine to five. Telecommuting, on-the-road working and web conferencing are stretching the concept of a “work-space” way beyond the confines of a physical cubicle.

This culture change is posing major challenges for employers, facility managers and workplace designers. There is a growing global need for adaptable, flexible solutions– not just now, but all the more so in years to come.

## Cubicle graveyards

“People want more flexibility in when and where work is done. The cultural, technological and physical environment must all work together to support employees’ abilities to make choices,” says **ERIC RICHERT**, Senior Advisor at Optimaze Inc., a California-based consultancy that helps companies improve productivity and reduce workplace infrastructure costs.

The need to “right-size” buildings is a significant cost issue for facility managers. “Today, spaces in most office buildings are on average only 35-60 per cent occupied at any given time. This means a lot of empty space is being heated, cooled and illuminated – a real waste of energy and money,” says Richert.

## Space for face time

One key challenge is balancing the competing needs for solo work and collaboration. Many tasks – writing, programming and designing – require a distraction-free setting. At the same time, a growing amount of work relies on communication and sharing of ideas among groups of people.

“Rather than primarily house individual cubicles, the role of the physical work environment will be as a place where people go when they interact face to face. These ‘hubs’ will house a greater variety of social spaces such as on-site coffee shops. They will also act as the company’s ‘city centre’, where expensive infrastructure such as laboratories, showrooms, and other special-use spaces are located,” predicts Richert.

**“A workplace is no longer just an office, but a combination of physical, virtual, social and mental spaces.”**

The needs of people and businesses are changing rapidly, but are buildings keeping up? Yes and no. Building owners are demanding more adaptable architectural layouts, yet the need for flexibility also extends to technology. HVAC systems, for example, should enable flexible coupling of affordable new energy sources as they become available in the future.

“Future-proofed offices and apartments allow building owners to choose the most competitive option and thereby maximise their building assets. Over time, they ensure higher premiums in both sales and rentals than conventional buildings,” says **PETER ROBERTS**, Managing Director of the UK company Uponor Ltd.



**ERIC RICHERT**  
Senior Advisor at  
Optimaze Inc.

# More comfort, happier workforce

Are you thriving or just surviving at work? The air you breathe can make all the difference.

**W**e hardly need science to tell us that we work better when we are comfortable. Numerous scientific sources, including the World Health Organisation, confirm that human performance can be improved by 10-25 per cent by providing superior indoor environmental quality.

This is verified also by Professor **BJARNE OLESEN** from the Technical University of Denmark, an expert on thermal environments and indoor air quality. He lists four critical ingredients for good productivity: efficient ventilation, uniform draught-free conditions, a temperature range of 20-26°C, and low emissions from building materials and furnishings.

“Comfort and good air quality help people think better. They get fewer headaches, get less tired, and don’t waste time complaining,” says Olesen.

## Stale air, stale ideas

Cleaner air reduces absenteeism, whereas recirculated stale air makes employees prone to asthma and other health disorders.

“These problems can be addressed with technology. A well-designed building minimises the heating and cooling demand and delivers optimal ventilation. But many buildings don’t perform as they should because the systems are incorrectly installed or maintained.”

The cost of an office employee in salaries and insurance is typically 100 times greater than the cost of energy. An investment in happier, healthier employees thus yields obvious payoffs in lower absenteeism and bottom-line performance.

“In the end, the whole of society benefits from fewer lost working days and lower consumption of medicines and medical resources,” says Olesen.

**“Studies indicate that the speed and accuracy of office tasks are affected by thermal comfort.”**

Source: Indoor Air Quality Scientific Findings Resource Bank



**“Fresher air can lead to gains of ten per cent in work performance.”**

Source: WHO

The new Uponor head office in Vantaa, Finland showcases the latest technology for creating a healthy, productive indoor environment. Uponor’s own radiant heating and cooling systems ensure a uniform level of draft-free thermal comfort. Additional ceiling cooling is coupled to underground wells to harness passive cooling energy for free. Nearly all respondents in a recent employee survey gave the indoor air quality and thermal environment a high acceptability rating. The building has BREEAM Very Good certification.



**BJARNE OLESEN**

Ph. D., Professor, Technical University of Denmark



## HOT AND BOTHERED?

*The optimum room temperature for good productivity depends on factors such as the clothing you wear and whether you are seated, standing or moving around. In offices where people are mostly sedentary, the ideal range is 20-24°C in winter and 23-26°C in summer.*

*The optimum air change rate depends on the number of people in the room and the level of chemical emissions from building materials. Good ventilation = 0.5 – 1 air changes per hour or about 10 l/sec/person.*

Source: European Standard EN15251



# ARE SMART HOMES A DUMB IDEA?

An army of gadgets doesn't make a home smart. Truly intelligent buildings deliver comfort by working together with man and nature.

**“Smart solutions should adapt to the user, not the other way around.”**



**MIKA PANTZAR**  
Research Professor at Finland's National  
Consumer Research Centre

## THE LOGIC OF TABS

*Uponor introduced the first concept of activating the concrete core of a building for energy saving and indoor climate control as early as in the mid-1990s. The currently offered version, the Uponor TABS (thermally active building) system is a self-regulating solution that cools and heats buildings by means of water flowing through pipes embedded in the structural slab. Integrating free and renewable energy sources, TABS technology brings notable cost savings: 30-50% lower installation costs and up to 50% savings in operating costs compared with conventional systems.*



## CONSUMER WISDOM

*Lack of control and lack of security are the main threats associated with smart homes as perceived by respondents in a cross-cultural study by Röcker et al. Consumers also expressed a desire for minimal programming and maintenance.*

*User Requirements for Intelligent Home Environments: A Scenario-Driven Approach and Empirical Cross-Cultural Study by Carsten Röcker, Maddy D. Janse, Nathalie Portolan & Norbert Streitz.*

[http://www.hitech-projects.com/euprojects/amigo/publications/roecker\\_et\\_al.pdf](http://www.hitech-projects.com/euprojects/amigo/publications/roecker_et_al.pdf)

**S**mart technology can control virtually everything in your home, from switching on your porch lights at sunset to changing the track on your favourite CD. You can operate a robot vacuum cleaner, adjust your thermostat and even feed your cat via remote handset while holidaying on a tropical beach.

But is a house filled with contraptions and cables genuinely smarter? A growing faction of critics is voicing sceptical views on the relentless march of “intelligent” solutions. One of them is **MIKA PANTZAR**, Research Professor at Finland’s National Consumer Research Centre and author of over a hundred articles dealing with consumers and technology.

His major works include Future home – inventing needs for domestic appliances, a critical study of how commercial innovators create needs for imaginary consumers. Real consumers then transform their lifestyles to accommodate conveniences they never needed in the first place.

**“Truly intelligent systems harness natural dynamics rather than relying on computers to manipulate nature.”**

### Power to the people

“People have been talking about the smart home of the future for the past hundred years, but why aren’t we seeing any? I’ve been waiting for an integrated system for TV, radio, computer and stereo ever since I was a young boy. But why are there still cords everywhere?”

Pantzar sees smart homes as a Utopian dream that could easily turn into a dystopian nightmare. His main gripe is the intrusive role that technology takes in running our lives, shifting the balance of power from people to machines.

“My main message is that autonomy is important. Homes that do all your thinking for you take away your freedom. I’m not against technology – I just want to remain its master.”

### Mind-reading machines

Pantzar is particularly dubious about smart applications that ineptly anticipate our needs, such as computers that automatically remove the “z” from his last name. “And those awful showers at public swimming pools that cut off the water just when the shampoo is running in your eyes.”

He sees many smart applications as focusing on trivialities rather than real problems, such as vacuum cleaners that switch off when the phone rings, or “robotlers” that serve refreshments but still need human help to pour drinks.

Where, asks Pantzar, are the intelligent home solutions that genuinely make our everyday lives easier? A real intelligent home, as he sees it, should offer ambient comfort without burdening consumers with unnecessary gadgetry and responsibilities.

### Natural intelligence

One good example of in-built intelligence is the thermally active building (TABS) concept, which utilises the laws of nature to let buildings control their own temperature. Conventional room conditioning technology is unnecessary when the building’s own storage capacity is used for temperature compensation and activated via natural heat sinks such as the ground or outdoor air.

A passive TABS system is self-regulating, eco-friendly and maintenance-free, creating a pleasant indoor environment through its own inbuilt logic, requiring minimal user intervention. The system in other words uses “waste” heat and cold air, harnessing nature rather than relying on machines to manipulate it artificially.

This type of comfort-enhancing innovation is welcomed as genuinely “smart” by Pantzar – provided that it is developed as a team effort with the building industry and user community.

“Consumer needs and technology are always co-evolving; you can’t separate them. There should be more co-design, more user-testing of prototypes and more cross-pollination of ideas between consumers and innovators.”





# Changes in construction

30,000

Current estimates of passive houses in Europe range in the order of magnitude of 30,000 units completed by 2012 (to be compared with the annual order of magnitude of 1,000,000 home completions in Europe).





Research indicates that green buildings can be **up to 12.5%** cheaper to build than non-green buildings.



Growing population density and aging infrastructure offer myriad challenges for the construction industry. There is increasing pressure for lower costs and shorter construction times, yet the need for comfort, health, energy efficiency, reliability and ease of use is growing. To bring these demands together, the industry is constantly introducing new ways of doing things in buildings and infrastructure.

# BUILDING A FUTURE – PROOF ENVIRONMENT

The construction industry must increasingly balance conflicting demands. These range from user needs and desires to environmental pressures and legislation. Solutions include building flexibility, information modelling, performance-based models and a more comprehensive approach.

“**W**e must move from segregation towards more integration in the industry. We must make the industry responsible and liable for the long-term use and functioning of the schools or other buildings they deliver. This will change the attitude of people in the whole supply chain,” says **GER MAAS**, chair of the European Network of Construction Companies for Research and Development (ENCORD)\* and the European Construction Technology Platform (ECTP).

“Nowadays people in the industry are only liable for the delivery of a house or a building, or even just a building part or a piece of equipment,” Maas says. “Who is liable for the functioning of the complete home, office or hospital?”

One tool to bring about this transformation, he says, is building information modelling (BIM), a communication tool for the whole lifespan of a structure. Another is a shift from traditional production contracts towards performance contracts such as Public-Private Partnerships (PPP).

“We should indeed move toward PPP’s and performance-based business models, where earnings are based on delivered performance, not on amounts of material and service,” agrees **ILARI AHO**, Uponor’s VP, New Business Development and CSR, who also chairs Green Building Council Finland.

“As clients shift from traditional delivery-driven contracts to performance contracts focusing on the use of a building, the industry will be



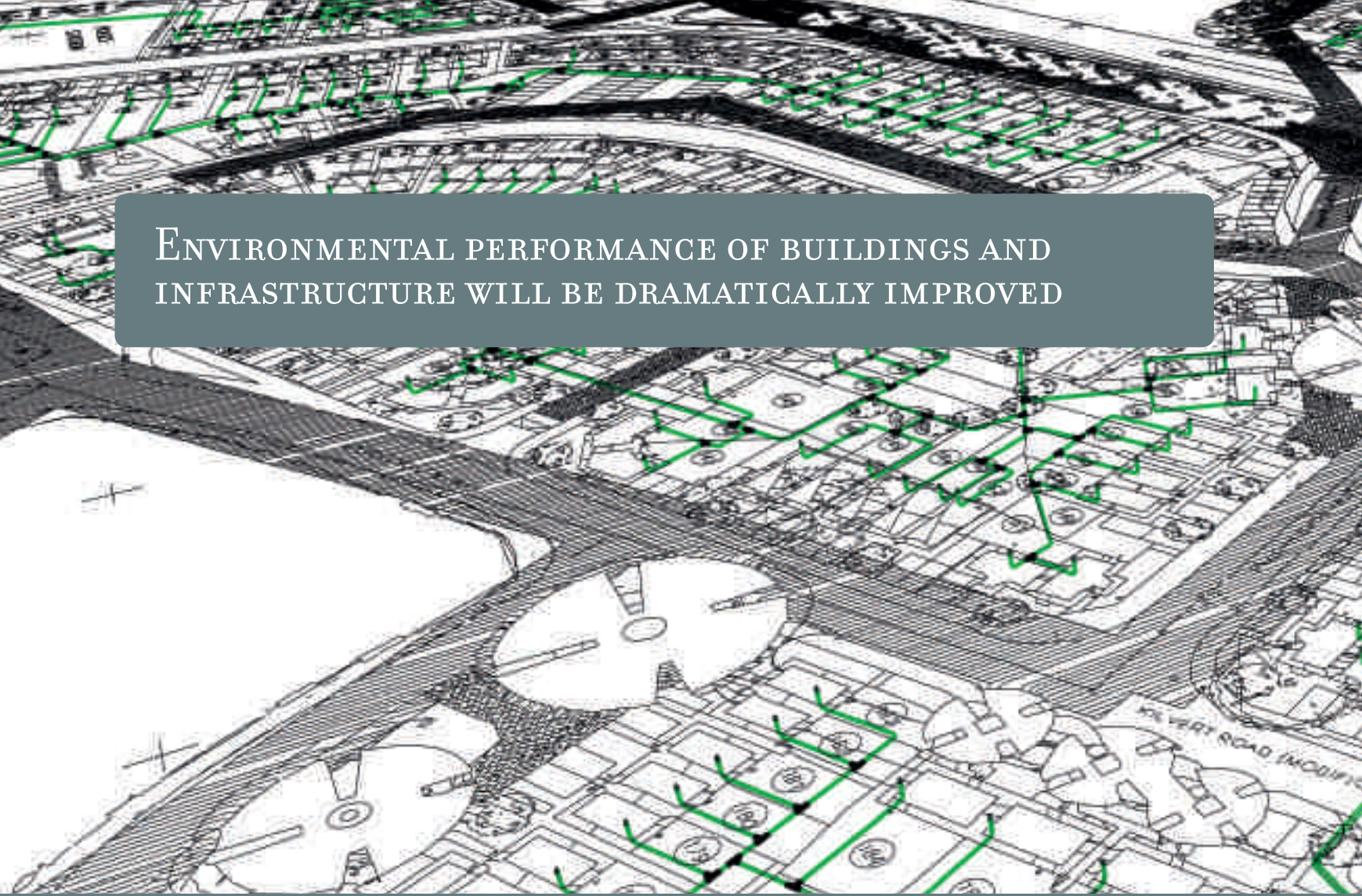
**GER MAAS**  
Chairman, European Network of Construction Companies for Research and Development (ENCORD)  
Chairman, European Construction Technology Platform (ECTP)



**ILARI AHO**  
Vice President, New Business Development and CSR, Uponor

\*<sup>1</sup>) In 2011, Uponor signed ENCORD’s Sustainability Development Charter, which incorporates such fundamental principles as lifecycle development, social responsibility in local communities, ethical working standards, caring for our employees and engaging our stakeholders.





## ENVIRONMENTAL PERFORMANCE OF BUILDINGS AND INFRASTRUCTURE WILL BE DRAMATICALLY IMPROVED

challenged to reinvent itself," says Maas. "This creates an opportunity to optimise the supply chain."

Aho also calls for involving suppliers immediately from the design and concept phase. As he sees it, the end results are better when projects are carried out in cooperation as larger entities.

"System integration and prefabrication provide improvement potential both for the efficiency of the construction value chain and for construction quality," he says.

"More prefabrication can also improve quality and create a safer environment for construction workers," adds Maas.

### A delicate balance

Customers are demanding lower costs and shorter construction time, yet also more sustainability, energy efficiency, reliability, comfort and ease of use. Is it possible to balance all of this?

"The question is not if it is possible – the industry has to meet the requirements of society," asserts Maas. "Lower cost, shorter time and lower maintenance are the minimum requirements that we must meet. Moreover the industry has the ability to support the European society in shaping a future-proof environment."

According to Maas, the industry can play a key role in helping Europe meet major societal needs. He sees three key areas calling for improvements in the built environment.

"First, the industry should play an important role in helping Europe to become more energy-independent. Secondly, most of our current infrastructure has been developed and designed for a period with smaller traffic volumes and lighter vehicles. Thirdly, our ageing society needs a resilient built environment where elderly people can live easily and move around in their neighbourhoods," he notes.

### BIM, a model for the future

Maas and Aho have high hopes for building information modelling (BIM), which the construction industry and clients are jointly developing for design, construction management and maintenance during the life of the building.

Aho expects that "BIM will enable more flexible design, and virtual performance assessment, evaluation and comparison of different design alternatives."

BIM is meant to facilitate the transparent creation and processing of digital representations of a building's physical characteristics and func-

## Keys to meeting future challenges

- Ready-made blocks and elements including plumbing and other solutions
- Pre-fabrication
- Reduction in the number of components
- Lifecycle contracts for public projects
- Flexible buildings that can be converted into new uses
- Involving of suppliers from the design and concept phase
- Sharing of knowledge from Building Information Modelling (BIM)

tions. These data models extend throughout its lifespan, from concept through construction, use, potential repurposing and demolition. They can be shared among stakeholders responsible for making decisions about the facility.

“We should share knowledge from BIM in the whole supply chain and during the life cycle,” adds Maas.

### Flexible and smart

Other technical waves that are on the way are smart, flexible buildings.

“Buildings and infrastructure will incorporate more intelligence, both in terms of technology and design intelligence,” predicts Aho.

“The biggest change in buildings, traffic and infrastructure will be stronger integration between them all by the integration of IT systems,” agrees Maas. “For instance, a road will no longer be designed for a fixed number of lanes, but the need of capacity will change the number of lanes and traffic speed during the day.”

“We should deliver flexible buildings that can be converted into new uses, or better yet, have multiple uses simultaneously. A school can be for teaching in daytime hours and community empowerment during the

evenings. Multiple use will reduce the resources needed as well as lower the number of facilities. In future, using rather than owning the asset will be the aim of construction.”

Meanwhile growing population density and resource scarcity pose major challenges and opportunities for the construction business.

“Resource efficiency is among the biggest challenges: how to provide a sufficient level of service to a growing population with less use of natural resources and more efficient utilisation of available financial and human resources,” says Aho.

“On the other hand, energy and resource efficiency will open up completely new markets for the construction industry, system suppliers and service providers. Environmental performance of buildings and infrastructure will be dramatically improved, for example through the introduction of near-zero energy buildings and decentralised use of renewable energy sources.”

# THE EUROS AND SENSE OF BUILDING GREEN

Green is the colour of buildings that deliver the triple bottom line value of people, planet and profit.

It's high time to debunk the myth that building green costs more. *The Business Case for Green Building* finds conclusively that green buildings can be cost-neutral compared with their conventional counterparts, provided that eco-strategies are integrated from the outset.

"The perception of cost is a barrier – not the actual cost," says **JANE HENLEY**, CEO of the report's publisher, the World Green Building Council. "The challenge today is helping the public understand the benefits of green building and creating demand so that investors and developers see that it's risky not to build green."

Industry professionals typically assume that building green increases costs by up to 29 per cent, but research indicates that green buildings can actually be 0.4 to 12.5 per cent cheaper to build than non-green buildings.

"The integrated thinking required to deliver a green building can make a real difference to cost, whether the building is green or not," says Henley.

## Future proofing

The Business Case for Green Building also confirms that green buildings are a "future-proofed" investment yielding higher asset value than their non-green counterparts. Potential buyers and tenants are increasingly willing to pay extra to live in a green building, be they renting or buying.

"Green and value are now inextricably linked. This is evidenced by the higher sale prices, higher rental and lease rates, lower operating expenses and higher occupancy rates of green buildings," says Henley.

The data clearly shows that the construction industry is embracing green building because it delivers a demonstrably better return on investment (ROI). An eco-inefficient building can significantly deplete rental income and the building's future value, while also presenting a high risk of premature obsolescence.

**"Just over half the firms surveyed, including architects, engineers, contractors, owners and consultants, anticipate that more than 60 per cent of their projects will be green by 2015"**

## Win/win/win

Applying green principles yields profits not only in residential development, but also in office design. "Investing in better indoor environments leads to better returns on one of every company's greatest assets: its employees. It can influence worker productivity by 10–25 per cent," says Henley.

Most importantly, green buildings deliver on the macro priorities of governments in areas such as climate change mitigation. Buildings offer the single largest opportunity to reduce emissions – and at the least cost.

"Green buildings reduce our impact on the planet, whether in carbon emissions, energy or water consumption. This saves occupants and owners money. And finally, they improve the health, wellbeing and quality of life of the people who live and work in them. Green buildings aren't a win/win – they're a win/win/win."

## Eco-trend takes hold

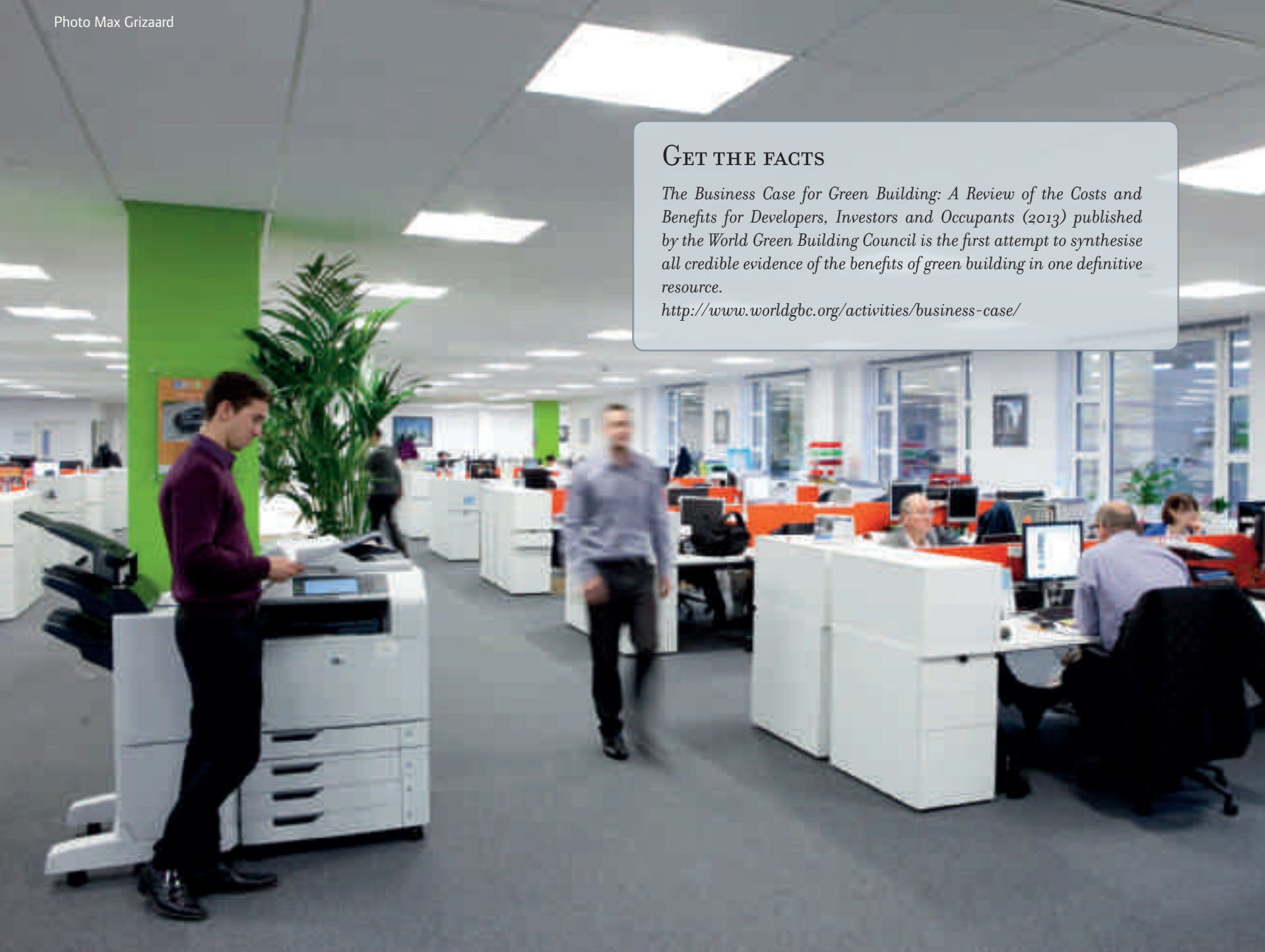
With such a wealth of incontrovertible evidence pointing to the tangible profits of building green, Henley affirms that the outlook for sustainable construction is extremely positive. The latest *World Green Building Trends* report reveals that green building is accelerating around the world as a recognised long-term business opportunity.

Just over half the firms surveyed for the report, including architects, engineers, contractors, owners and consultants, anticipate that more than 60 per cent of their projects will be green by 2015 – an astounding increase given that the global market share of green buildings was only two per cent as recently as eight years ago.

## GET THE FACTS

*The Business Case for Green Building: A Review of the Costs and Benefits for Developers, Investors and Occupants (2013) published by the World Green Building Council is the first attempt to synthesise all credible evidence of the benefits of green building in one definitive resource.*

<http://www.worldgbc.org/activities/business-case/>



**“Lower operating costs were deemed a key benefit of building green by 76 per cent of respondents.”**

Source: World Green Building Trends Report, 2013

[http://www.worldgbc.org/files/8613/6295/6420/World\\_Green\\_Building\\_Trends\\_SmartMarket\\_Report\\_2013.pdf](http://www.worldgbc.org/files/8613/6295/6420/World_Green_Building_Trends_SmartMarket_Report_2013.pdf)

**JANE HENLEY**  
CEO, World Green Building Council

# TRADITION MEETS TECHNOLOGY

Self-sufficient designs for the future



*The Centre of Virtual Engineering of the Fraunhofer Institute in Stuttgart, Germany boasts an impressive architecture combined with tomorrow's knowhow in energy efficiency and environmental friendliness. The building, whose heating and cooling technology is based on Uponor's geothermal energy solution, has been awarded the German DGNB Gold Certificate.*

*Photo: Christian Richters Photography*



**Prof. BRENDA VALE**  
co-author of *The Autonomous House* and *Time to Eat the Dog?: The Real Guide to Sustainable Living*

**S**tand-alone, 'off-the-grid' buildings and villages are likely to proliferate in the coming decades. Sustainable architecture pioneer **BRENDA VALE** says that the key to creating them is common sense, with an eye on millennia-old cultures.

Buildings and communities must be constructed with future generations in mind – and it is likely that people living even one generation from now will face a densely-populated planet with dwindling resources, rising temperatures, more extreme weather and unstable national grids.

Preparing for this, many experts say, requires autonomous or semi-autonomous buildings and communities that are largely self-sufficient in terms of energy, heating and cooling, waste management and so on.

In western countries, there is a small but growing trend toward this kind of building, with a variety of experimental approaches already existing. Over time, as communities and societies evolve, the concept will become more mainstream and solutions will likely be offered on a wider scale.



# “The key is integrated design, implementation and management of the urban structure, services, and all the infrastructure needed to make it run.”

## Communities in a key role

According to Professor Brenda Vale, a Cambridge-educated architect and leading author in the field of self-sufficiency, those in the developed world who are seeking such solutions should take some lessons from those elsewhere who know how to build simply, within their resources and the demands of their climate.

“There is a vast contrast in the way of life between the developed and developing nations, but a clear trend toward greater self-sufficiency, particularly at the community level exists also in the western world,” says **ILARI AHO**, Uponor’s Vice President, New Business Development & Corporate Social Responsibility. “Fully self-sufficient buildings are a feasible concept only in isolated rural environments. In an urban and suburban context, self-sufficiency should and will be addressed on the community level, because that is where the economics of self-sufficiency work out.”

“From the environmental point of view, closed-loop utilisation of resources on a local level is a prerequisite of sustainability in the long term,” says Aho. “Transporting resources and waste is currently a big burden on the environment. A step change in efficiency is required.”

## Zero-energy homes

In western countries, the idea of self-sufficient communities attracts a certain amount starry-eyed New Age thinking. However building a home or village that can truly function off the grid requires precise, hard-nosed design.

Myriad factors must be taken into account, considering all possible daily, seasonal and long-term climatic changes – and even those that may seem far-fetched today.

Yet it does not require exotic or high-tech equipment, says Vale, who has designed a number of pioneering autonomous buildings and communities in England with her architect husband, Prof. **ROBERT VALE**.

The couple designed an autonomous settlement at Hockerton, central England, in the early 1990s. The village is now a net

energy exporter. The Vales now live in a 1939 building that meets German Passive House standards.

“There are no major challenges in making buildings self-sufficient,” she says. “We have made autonomous buildings using off-the-peg materials and technology.”

These include “insulation and solar to keep warm, migrating round the house if necessary, light colours, ventilation and trees to keep cool – all the traditional ways humans have been using for centuries,” says Vale.

“Our buildings have water coming from the roof being stored for re-use. Sewage is either composted in a waterless toilet or treated in a reed bed, where there are a group of houses. Electricity is either small-scale wind or grid-linked photovoltaic systems, sometimes with solar hot water systems.”

“Zero-energy buildings are already now technically fully feasible,” Aho notes.

“The main requirement for self-sufficient communities is the ability to tap into locally available natural and waste heat resources.”

“Self-sufficient buildings have to work with the available natural resources of sun and wind,” agrees Vale.

“Living within your own resources is easier when you can see how much you have stored, such as a tank of water, knowing this is the only water you have until it rains again. It makes you careful in husbanding your resources.”

As Aho sees it, the key is integrated design, implementation and management of the urban structure, services, and all the infrastructure needed to make it run. The most important building blocks include closed-loop water, sewage and waste management systems, energy systems based on locally-available sources and intracommunity transport based on light, flexible modes. These individual systems and solutions must be intelligent, flexible and adaptable to changes in the surrounding society, he argues.

“We need these new closed loop technologies, and we also need to recognise that using these requires behavioural change,” adds Vale.

“In the long run, this must be turned into standard practice and business-as-usual,” says Aho. “Otherwise the carrying capacity of the planet will not be enough to sustain our current living standards and economic activity level.”

Zero-energy buildings are already now technically fully feasible.

For more information:

[www.passiv.de](http://www.passiv.de)

[www.transitionnetwork.org](http://www.transitionnetwork.org)

[www.hockertonhousingproject.org.uk](http://www.hockertonhousingproject.org.uk)

[www.smart-cities.eu](http://www.smart-cities.eu)



# THE PASSIVE HOUSE

– How will that impact the industry?

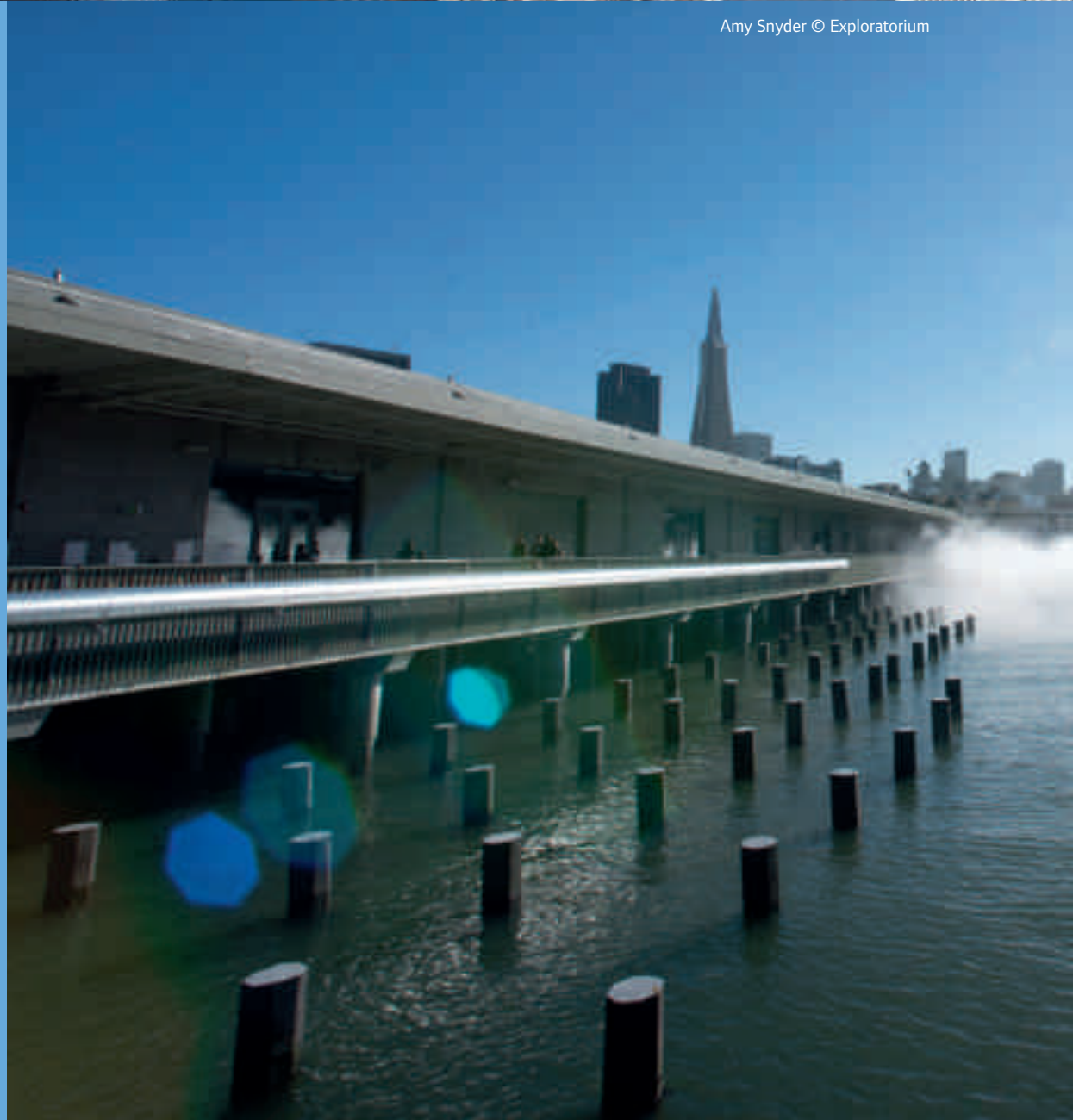
Amy Snyder © Exploratorium

## **LEED® Platinum rated Pier 15 Exploratorium utilises innovative radiant cooling**

*The Exploratorium project at Pier 15 in San Francisco has become a model on innovative sustainable design after its announced intent in September 2012 to become the largest net-zero energy use museum in the U.S. The goal was achieved on 10 January 2014 as it was awarded LEED® Platinum certification by the U.S. Green Building Council. The 800-foot-long pier, erected nearly a century ago underwent a major renovation, including structural repairs to its pilings for the next 100+ years.*

*The new Exploratorium has many notable green features, including large photovoltaic solar panels and an innovative Uponor radiant cooling system that uses water from the San Francisco Bay to meet comfort demands.*

*Read more at:  
[www.uponorpro.com](http://www.uponorpro.com)  
> Marketing and Sales  
> Case-Studies.*



**Over the last decade, studies on the actual performance of passive houses have raised concerns on the indoor air quality and summer thermal comfort levels in these buildings.**



The passive house standard is originally a German voluntary performance standard defining requirements for ambitious energy performance levels and reduced environmental footprint of buildings. In public discussion passive house is often misinterpreted to mean homes without heating systems. This is, however, not the case – all passive houses have one or the other form of heating installed, most often integrated with a mechanical ventilation system. A passive house should never be connected with thicker insulation only, many other matters deserve a close attention, too.

For this reason, a ‘passive’ building projects needs to be planned and developed as a total concept. The expertise and knowhow of the builder and the construction service providers is of utmost importance.

Since its development, the passive house approach has gained considerable popularity and current estimates of passive houses in Europe range in the order of magnitude of 30,000 units completed by 2012 (to be compared with the annual order of magnitude of 1,000,000 home completions in Europe).

The passive house is only one approach among many towards improving the energy performance of buildings. There are examples available of even more ambitious improvements approaching the net zero energy performance level etc. The overall low energy trend is gaining momentum and will in the 2020’s be a defining factor of the construction market.

With the introduction of ‘passive houses’, the need for energy consumption will decrease clearly, which has been the target all along. The current *European Directive of Energy Performance of Buildings* requires Member States to ensure that new buildings reach a near-to-zero energy consumption level by 2020.

The demand for building technology is not expected to change in a similar way. In order to curb energy consumption, the demands set for the technology may increase and a demand for ever smarter technological solutions is expected to increase.

In the shorter term, reduced heating energy consumption will lead to a higher market demand for efficient cooling solutions. “Uponor’s underfloor heating systems can provide also cooling functionality with straightforward and cost efficient additions to the installation. We have

already launched the first products for this purpose over the last years and further development is in the pipeline,” says **NICLAS FERDING**, Uponor Vice President, Sales and Marketing - Building Solutions Nordic.

Over the last decade, studies on the actual performance of passive houses have raised concerns on the indoor air quality and summer thermal comfort levels in these buildings. The passive house movement has partially due to these concerns been countered by an industry-lead Active House Alliance, promoting a different design approach towards the same goal of extremely low energy use in buildings.

“We are working actively to integrate our indoor climate offering to provide complete heating, cooling and ventilation systems optimised both design and controls-wise to extremely low energy demands while at the same time maximising user comfort and convenience,” says **FERNANDO ROSES**, Executive Vice President, Offering and Supply chain for Uponor Building Solutions - Europe.

“Uponor is taking steps to respond to this trend by redesigning its offering, system design and engineering principles to a low/near-to-zero energy building environment, developing its controls products forward towards higher degree of systems integration and optimisation, and through building a stronger role of ground-source free energy systems in our portfolio,” Roses continues.

Strict low-energy consumption requirements, combined with other performance-based construction requirements, will have a fundamental influence on the building sector as a whole. It requires the industry to assume higher levels of performance guarantees and responsibility: whole building design approaches, change to and simplification of the complicated value chains of construction. Consequently, it will require companies in the industry to review their business models towards delivering functionality and performance instead of only physical products.

Large construction firms are taking steps in this direction with targets set to simplifying their supply chains. One route has been to look for suppliers who take an operational responsibility (for energy performance, for instance) for the systems they have supplied. In different parts of Europe, building projects have been implemented using various life cycle cost or PPP models. For the moment, these are experimental examples and a large scale transfer will take time.



# GREENING UP HISTORIC HOMES

With new retrofit technology, heritage buildings can be upgraded to offer unparalleled comfort and energy savings – without sacrificing an inch of style.

Overlooking the Outer Alster Lake in a sought-after quarter of Hamburg stands a graceful row of villas on the waterfront avenue of Schwanenwik, surrounded by leafy parklands, sailing boats, cafés and restaurants. Listed as an official German heritage site, the three stately Jugendstil villas built in the late 19th century represent the finest Hamburg has to offer in high-end living, combining old-world charm with modern residential comfort.

The “comfort” part is new, however. The villas at Schwanenwik 32-34 are in the midst of a major modernisation project to restore their century-old façades and stucco ornamentation and bring their technical amenities into the 21<sup>st</sup> century.

## Showpiece of tradition

“Many people wrongly assume that old buildings are always draughty, uncomfortable and costly to heat and cool. Today even the oldest buildings can be upgraded to satisfy future needs through the installation of energy-efficient heating and cooling systems that enable flexible usage of renewable energy sources,” affirms Hamburg-based Uponor technical sales consultant **DANIEL KLOPP**.

The Schwanenwik project showcases the innovative, unobtrusive way in which flexible plastic piping can be worked around existing structural components to transform an old building into a sustainable, high-performance, “future-proofed” investment.

The Wilhelminian architecture of the villas has now been restored to its former glory, with new radiant heating and cooling systems invisibly embedded in the structures to provide even, draught-free thermal comfort, while also bringing savings in fuel bills and greenhouse gas emissions. With ceiling heights averaging four metres, radiant heating and cooling provides more comfort for less energy than conventional forced air systems.

## Team around the table

Working together with engineering contractors AE Plan of Hamburg, Uponor was involved in the project from the get-go, providing consultancy to find the optimal retrofit solutions for this challenging project.

“Refurbishing a historic building in a busy neighbourhood requires careful planning. Renovation is often more complex than new construction, so all players must sit down together early in the process to save headaches later down the road,” says Klopp.

The main issues were the shallow floor depth and the need to carefully preserve the original features of the period architecture. Added to that, the installation had to be completed quickly and efficiently to minimise disturbance to existing residents.

“Uponor systems provided the ideal solution to the technical challenges we faced, especially the shallow floor depth. I was impressed by how simple they are to install. And it’s important to me as an engineer to rely on an all-inclusive solution. Uponor has provided excellent advisory services and support throughout the planning and installation process,” says project coordinator **SEBASTIAN RODECK** of AE Plan.


## Sensitively sustainable

The Schwanenwik project offers an excellent example of how heritage buildings can be “greened up” for long-term sustainability, yet with sensitivity to their historical value.

“The villas are now linked to the district heating network for affordable, eco-efficient energy. If desired in the future, the heating and cooling system can be coupled to alternative renewable energy sources such as geothermal energy. The radiant heating system also provides optimised heat recapture,” explains Klopp.

The renovated villas are estimated to be approximately twelve per cent more eco-efficient than before thanks to Uponor’s radiant heating and cooling system. Owing to the property’s status as a heritage site, part of the renovation costs can be reclaimed by the investor as tax rebates.

**“Comfort and period architecture are no longer mutually exclusive options thanks to new retrofit technology.”**



**“Radiant heating and cooling provides a level of eco-efficiency rarely seen with conventional forced air systems in old buildings.”**

## Best of both worlds

The noteworthy features of the project include more than 800 metres of Uponor multi-layer composite pipe in the upgraded tap water installations. The same pipe also provides a distribution line for the heating and cooling network.

The Uponor Siccus renovation system was chosen for heating and cooling the existing downstairs apartments. With the pipes discreetly hidden in the floor structures, the original architectural elements are untouched.

“Thanks to its lightweight, compact design, Uponor Siccus is ideal for modernising old buildings with a shallow floor depth. As it takes up little space under the floor, there is no conflict between technical and aesthetic demands,” explains Klopp.

The new attic apartments and penthouses to be added in 2014 will be fitted with state-of-the-art Uponor Tecto underfloor panel heating systems. Due to the unusual room geometry, the floor heating system has to be flexible and simple to integrate.

“Thanks to the large prefabricated studded panels into which the pipe is fed, the Tecto radiant heating system enables approximately 20 per cent faster installation than conventional methods. The job will be completed in only 20 days,” says Klopp.

## Modernisation of Schwanenwik 32-34

### FAST FACTS

When: 2010-2014

Where: Hamburg-Hohenfelde

Gross floor area: 12,200 m<sup>2</sup>

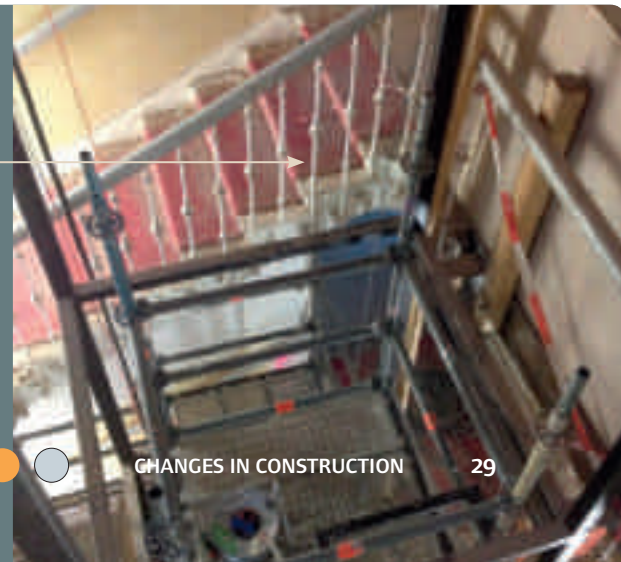
Number of apartments: 33

Architect: Architektur Martin Hecht, Hamburg

Engineering: AE-Plan, Sebastian Rodeck, Hamburg

Plumbing, heating and cooling systems: Uponor

<http://www.evoreal.de/projekte/schwanenwik/>



# THE CHALLENGE OF RENOVATION DEBT

When middle-aged buildings and infrastructures require renovations, the challenge is to carry out repairs without incurring great costs or inconvenience.

## BETTER TOGETHER: CASE MAUNULA

*Two years ago, an association of homeowners in the Helsinki suburb of Maunula came up with Finland's first-ever cooperative renovation solution. Six housing companies, supported by the Ministry of the Environment, joined forces to find one contractor for their project, which was completed in autumn 2013.*

*By joining forces, the housing companies were able to reduce overall costs by ten per cent and benefit from numerous other advantages of working together.*

*"The project comprised renovating water, sewerage and ventilation systems, and the Uponor Cefo range, which includes all the required products, was chosen for the project," says Sales Manager **TONI WAHLFORS**. "The modular designs ensure ease of logistics and installation, resulting in a shift in focus from building onsite to merely installing onsite."*

*The project, which was successfully completed in autumn 2013, renovated 293 flats in seven different buildings, most of which were built in the early 1960s.*

One of the most common reasons for renovation debt is neglected plumbing repairs maintenance, according to **VILLE RUOHIO**, who heads Uponor's Building Solutions business in Finland.

"Insurance companies pay out 162 million euros annually in water damage compensation in Finland," says Ruohio. "That amount of money, which is used to repair water damaged buildings, could be used to purchase new modern water pipes and plumbing for approximately 40,000 small houses.

"Lack of knowledge about the limited life expectancy of old metal pipes is the main reason for the increase in water damage cases due to old plumbing," he says.

## Origins

In Finland, the pace of building was fast in the 1970s, as people moved from the countryside into the rapidly growing suburbs. Up to 70,000 apartments were built each year, which is twice the current number of new builds.

Ruohio points out that those buildings should have been continually repaired and renovated from top to bottom, including elements such as roofing and facades, for example. Unfortunately, this didn't happen and now there are numerous repairs vying for housing company budgets.

Consequently, renovation debt grew, as did insurance payouts. Ruohio stresses the importance of timely maintenance in order to avoid greater expenses and damages down the road.

He compares the situation to playing a game of Russian roulette.

"If you live in a house that has not kept up with its maintenance repairs and was built prior to the 1990s, there's a 25 per cent chance of water accident damage occurring within in the next 10 years," says Ruohio. He adds that a house or apartment building built in the 1980s with metal pipes is very close to the end of its lifecycle.

In the worst-case scenario, water damage requires residents to move out while waiting for repairs and the drying process to be completed. "Insurance rarely covers everything, and water leaks and damage can also destroy personal items that can't be replaced with money," he says.

## Solutions

Uponor's KOTI ("koti" means home in Finnish) started out as a web service solution to manage new build single family homes, but has recently been expanded to include actual renovation services including the installation of modern plastic pipe systems.

It promises "to give a small house's pipe infrastructure an additional life of 100 years in four days for 4,000 euros," says Ruohio. This is a substantially shorter amount of time and far less expensive than other pipe renovation processes whereby homes are inhabitable for many months on end.

"Together with contractors, we have developed a model that allows contractors who belong to our network to focus on their area of expertise, their core competency, while Uponor takes care of the management, the planning, accounting and communication," says Ruohio.



## SWEDES DEBATE ABOUT WATER QUALITY

*In Sweden, there's recently been public debate about water quality due to the fact that in the years 2010 and 2011 close to 50,000 inhabitants became sick owing to compromised water quality in the towns of Östersund and Skellefteå. In the community of Torsby, residents were encouraged to boil their household water prior to use, as water tests in the northern parts of the community indicated E.coli bacteria in the water. Svensk Vatten (Swedish Water Company) spokespeople demanded more public debate in order to push political decision-makers to take action. The town of Östersund estimated that costs to the community to secure the health of its inhabitants due to the water quality problems exceeded SEK220 million (about 25 million euros).*

*The Swedes have calculated that renovation debt regarding the public water infrastructure currently exceeds 2,000 euros per capita, while the renewal rate of the water network may take up to 250 years. According to a 2008 report by Sweden's Royal Technical University, Sweden ranks as number 9 globally in terms of drinking water quality, after countries such as Finland, Great Britain, Japan, South Korea and Russia.*

# ALL IN ONE

As the number of multi-purpose buildings such as those that house shopping malls, hotels or apartments, and transportation grows, different solutions are needed.

What does the future hold for multi-purpose buildings? During a Nordic Building Forum seminar talk a few years ago, architect and Aalto University professor **TREVOR HARRIS** put up a slide that read: “We can ‘grow’ buildings.”

That simple phrase captures the essence of multi-purpose buildings now and in the future, as they must grow to meet many demands, not the least of which is being green. Multi-purpose buildings need to incorporate sustainability and its management into building design while improving the quality of life for those who use the building, whether for work, leisure or both.

Bangkok’s Suvarnabhumi Airport in Thailand is a good example of a multi-purpose building that has high demands placed on it. Today, Suvarnabhumi is the 14th busiest airport in the world – 53 million passengers passed through it in 2012 alone.

When the airport opened in 2006, Uponor was one of the main partners responsible for Suvarnabhumi’s indoor climate system.

“The main challenges to ensure a comfortable indoor climate for the passengers in the Bangkok Airport project were the transparent building concept in combination with the climate conditions in that region. It was the first project of its kind in that climate [hot and humid] and we had to look after the quality of design and installation for this unique application,” says **HOLMER DEECKE**, Manager of Engineering and Special Projects for Uponor. “Our consultancy and supervision on site ensured a smooth construction process and a well-functioning indoor climate system in the end.”

Deecke says that the challenges were solved in a number of ways. “We had close cooperation with the German consultant, Transsolar, who convinced the owner that this energy concept applied would be the only possible energy efficient option for this transparent building. The combination of a radiant under-floor cooling system with a smaller dimensioned displacement ventilation system required some special considerations regarding architectural and constructional terms. For example, dealing with accurate shading or the development of a project specific roof membrane to reflect the radiation from the floor,” he says.

According to Deecke, trends driving multi-purpose buildings in the future include: flexibility of space utilisation, glass/transparency is dominating, cooling is needed, the green trend prevails, as does energy efficiency and sustainability.

“Uponor has a lot to offer in this respect. Even if the special requirements of multi-purpose buildings need special care for finding an appropriate solution,” he says.





# BUILDINGS WITHOUT BOUNDARIES

Chameleon buildings answer a growing demand for functional flexibility

Manchester Metropolitan University

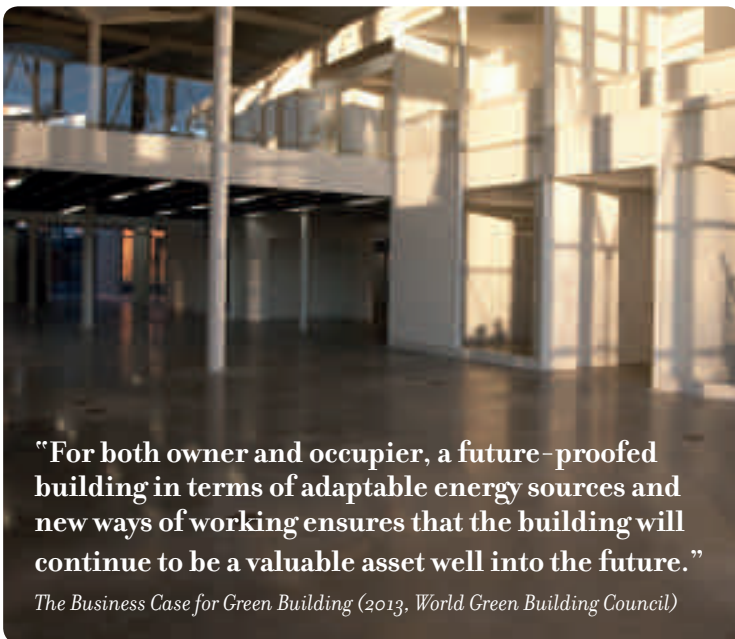


The demand for architectural flexibility is witnessing a growing need for new concepts on how we can provide heating, cooling and distribute services in buildings more effectively and efficiently, whilst still retaining future flexibility. Uponor's design experience and new solutions make this possible by combining flexibility with energy efficiency.

## MILES AHEAD IN MANCHESTER

*The new Business School and Student Hub at Manchester Metropolitan University makes an impressive statement for progressive green design. The facilities offer flexible interconnectivity, with informal social learning zones mixed with conventional lecture rooms. With a heavy emphasis on carbon reduction, it is among the first buildings in the UK to utilise an innovative TABS (Thermally Activated Building Structures) cooling system. Engineers from Uponor worked closely with the whole project design team to deliver this solution, which has now been adopted in further buildings for the University.*

*Concrete Society Awards 2012: Sustainability Award  
LABC Building Excellence Awards 2012: Best Education Development*



**"For both owner and occupier, a future-proofed building in terms of adaptable energy sources and new ways of working ensures that the building will continue to be a valuable asset well into the future."**

*The Business Case for Green Building (2013, World Green Building Council)*

## CLEMSON'S CLASSROOMS OF THE FUTURE

*Clemson University's Lee III building in South Carolina teaches sustainable design by example. Students of varied disciplines work side by side in an open, transparent layout that organically invites collaboration. Teaching facilities and social spaces are mixed to promote discovery-based learning.*

*The building incorporates a host of green features including a heating and cooling system supplied by Uponor. The radiant system is one of the first to be deployed in such a humid climate in the USA. The Uponor solution is embedded in the floor construction, which allows flexible use of the entire floorplate. With high ceilings in the main spaces, comfort is maintained through the radiant system at floor level. This achieves significant energy and cost savings in comparison to traditional air-based solutions.*

*Winner of the American Institute of Architects National Honor Award for Architecture, 2013*





# Changes in Uponor

“The megatrends reshaping our future – such as the growing need for energy efficiency, sustainable resource consumption and clean water supply – and an understanding of specific segment needs mark a paradigm shift to **innovating eco-efficient solutions** for heating, cooling and hygienic water distribution.”



“Change itself is not the key. To succeed in today’s complex business environment, you need to build the right mind set and the **ability to adjust** into changing circumstances.”

Uponor has a long track record of renewal and innovation. To fulfil its objective of creating better human environments, the company wants to stay aware of changes in consumer needs and in the industry. For Uponor, the chosen way to meet these changing expectations is through cooperation with a network of like-minded partners.

# BUILDING TOMORROW

Uponor President and CEO Jyri Luomakoski shares his view on how green building is reshaping the business landscape.

**T**here is an old Finnish saying that “a man is not a man until he builds his own cabin”. This may have been true over a century ago, but today – in the wake of climate change and environmental challenges – green building is rewriting the rules of the game. Today, building is very much a team sport rather than a solo venture.

“The growing demand for energy efficiency and sustainable solutions is leading to increased complexity. Today, building is an intricate team effort between a number of designers, suppliers and subcontractors – nothing that one man and his axe can handle,” says Luomakoski.

AMID THIS GROWING COMPLEXITY, Luomakoski sees vast potential for companies that adopt a “granular” approach: understanding the big picture and breaking it down into smaller, manageable opportunities.

In Uponor’s case, this means looking at the megatrends reshaping our future – such as the growing need for energy efficiency, sustainable resource consumption and clean water supply – and then developing

**“Energy efficiency and cost efficiency are not warring issues.”**

eco-efficient solutions for heating, cooling and hygienic water distribution.

“Green differentiation is at the core of our strategy. We are constantly listening to the market to deepen our insight of key value drivers for our customers and peers. Sustainable success requires partnering and a win-win mindset,” says Luomakoski.

THE GREEN AGENDA, some argue, is being pushed aside by the current stormy economic weather, but Luomakoski disagrees. “Sustainability and energy efficiency remain at the top of the global agenda. Energy efficiency and cost efficiency are not warring issues. Research confirms

that when done properly, green building doesn’t cost more than its conventional counterpart. It’s all about changing people’s perceptions.”

Uponor, too, must embrace the necessity for change and respond to future challenges with greater agility, affirms Luomakoski. “In my work with my peers across many industries, I am privileged to have a helicopter view of what is happening in the economy. Change is our fundamental reality, so we must be prepared.”

**“We deliver substance, not promises.”**

ACCELERATED INNOVATION is arguably the clearest expression of Uponor’s future-focused mindset. A topical example is Uponor’s newly launched Seamless Aluminium Composite (SAC) pipe, featuring new multi-layer extrusion technology that eliminates the need for welding. The pipe has clearly improved durability, and being joint-free and extremely flexible, it is significantly faster to install.

“This innovation is a response to the growing complexity of construction and the need for greater installation speed. It’s the latest example of our efforts to maximize value for our peers.”

CONTINUAL LEARNING, too, is a critical part of Uponor’s self-renewal. A variety of internal training programmes are offered, with senior executives involved in coaching to help employees understand how the business is evolving.

“We are investing a lot of time and resources in green building projects pooling the resources of the academic and business worlds. We are also active in the Green Building Councils in various countries, where we work constantly to broaden our understanding of this complex adventure called green construction.”

Though confident that an investment in Uponor is an investment in the future, Luomakoski prefers to let facts and actions speak for themselves. “We adhere to a policy of open communication, allowing our investors to judge for themselves whether we are doing the right thing. We deliver substance, not promises.”



## Winning the race for change

At Uponor, we are keen about innovations. We have a tradition of introducing new products for our customers and we are innovating new marketing concepts as a way to succeed in flat markets. In short, we are always in the midst of changes.

Some years back, we entered the project business segment, whose business logic differs significantly from the traditional distributor business. It gave us the challenge to develop our competencies and processes to ensure high customer satisfaction and service to our global project customers across the world. More recently, we initiated Uponor Infra, giving us the challenge to combine two different companies and cultures. We have also implemented organisational changes, increased our focus; all geared to create added value to our customers. The mind thrives in change, and it is a good thing to be able to innovate yourself, especially now as the markets in general have remained rather flat.

Change itself is not the key. To succeed in today's complex business environment, you need to build the right mindset and the ability to adjust into changing circumstances as we go throughout the entire organisation. Equally important is to obtain skills to observe what is happening around us, understand the implications to business and be able to adjust the ways of working to reflect the new reality.

Things change only when people change, and those who are the fastest to interpret the new reality and lead the organisation to the right direction will be the winners. Building the required skills into the organisation is a long-term exercise. It starts with leadership, building the understanding of the new reality and coaching leaders to grow skills to lead and support their teams. It requires dialogue, concrete examples and sharing of best practises. It also impacts the development discussions we have with employees, with increased focus on strengthening the right behaviours and coaching people to find innovative solutions going forward.

Our current focus in people development is on developing sustainable leadership that develops needed competencies, and creates energy and the ability to be winners also in the future.



# A STRONG GLOBAL PLAYER

**U**ponor Corporation and KWH Group, both based in Finland, merged their infrastructure pipe businesses into a new joint venture, Uponor Infra Ltd, in 2013. While focusing on northern Europe, it's poised to tap into emerging global trends.

Uponor aims to save 10 million euros annually as a result of the deal, which has already led to a reduction of overcapacity in the Nordic region. The merger brings economies of scale benefits and better capacity utilisation. Higher volumes and longer extrusions help reduce costs.

Uponor and KWH were the third and fourth-largest Nordic firms in the sector. Combined, they are set to become number one in the region.

## A smooth fit

The two companies make an excellent fit. KWH Pipe was considerably larger, with more than twice as many employees. Together they have a workforce of around 1,500 professionals.

While Uponor overall is a bigger player in the pipe industry with more resources, KWH Pipe had extensive international networks in the pipe business. Joining forces gives them a broad, complementary manufacturing footprint. This is essential as large pipes tend to be used close to where they are manufactured.

Their non-overlapping product ranges make it possible to focus on a strong product and offering range.

Uponor owns slightly more than half of the new company, which has manufacturing and sales in Europe, North America and Asia.

KWH's pipe business dates back nearly 60 years, with international operations since the 1960s. It was one of the first global producers of large-diameter pipes. KWH Pipe had 10 production facilities in Europe, Thailand and Canada – where it's been a leading player for more than 40 years.

Uponor's infrastructure business focused on storm water and sewer systems. It had factories in Finland and Sweden, with sales throughout the Nordic-Baltic region and Russia.

"Our main customer groups, the construction industry and the municipalities, will benefit from this deal, as a result of increased cost

efficiency in operations, enabling us to provide a wide offering of innovative quality products and systems," says Uponor Infra's President **SEBASTIAN BONDESTAM**. He cites "critical mass in R&D", noting that there are "many smart heads in both companies" who are now working together to benefit customers.

## Gushing demand

Supplying local markets with tailor-made products from Thailand to the Czech Republic to Canada, Uponor Infra is well placed to ride the wave of growth in the sector.

According to a study published by the Dallas-based RnR Market Research in May 2013, global demand for water pipe is expected to rise by 6.8 percent annually through 2017 to almost 14 billion metres, accelerating faster than in 2007–2012. Plastic pipe will show the fastest growth, particularly in water distribution, it predicts.

According to the report, "advances will result from two key factors: in developing nations, access to water supply and sanitation will be increased; in developed nations, a rebound in construction spending will boost demand for building pipe."

Indeed, population growth and the flight toward cities are spurring ever-spiralling demand for urban sewage and clean-water systems. Climate change also plays a role. And infrastructure needs to be more durable

to withstand extreme weather and fluctuations – with the crucial importance of sturdy storm drains spotlighted by recent hurricanes and typhoons.



Uponor Infra is led by **SEBASTIAN BONDESTAM**, who has served at Uponor since 2007, most recently as EVP, Infrastructure Solutions, prior to his current role.



## Uponor and KWH Pipe's paths converge

- 1955** KWH (then Wiik & Höglund) begins delivering polythene pipes
- 1965** Uponor (then Upo) begins manufacturing plastic pipes in Nastola, Finland
- 1967** KWH (Wiik & Höglund) opens plant in Ontario, Canada
- Early '80s** Uponor expands in Scandinavia/Europe
- Late '80s** Uponor expands in North/South America
- 1988** KWH Pipe established
- Early '90s** KWH Pipe expands in Europe/Asia
- Early 2000s** Uponor decides to focus on Nordic countries
- 2012** 21 September 2012 merger of Uponor Infrastructure Solutions and KWH Pipe announced
- 2013** 24 May 2013 Finnish Market Court approves joint venture plan
- 2013** 1 July 2013 Uponor Infra starts operations
- 2013** 8 November 2013 Uponor confirms closure of two smaller production units in Finland, following the closure of one production facility in Sweden and one office in Denmark.



# DRIVING DEVELOPMENTS IN A CHANGING INDUSTRY

Proactive innovation and productive partnerships are among the tools Uponor uses to keep ahead of the rapid changes reshaping construction and renovation markets today.

“Although people’s basic needs relating to the built environment don’t really change fundamentally, expectations and standards are constantly rising,” says **ESA HIRVONEN**, Uponor Vice President, Technology. “Awareness of environmental issues is particularly growing, and our clients want to get more from less, enjoying good quality water and optimal indoor climate while saving on materials and energy use throughout building life cycles.”

The spread of information and communications technologies has changed our lifestyles and expectations. New technologies mean that information and services can be available 24-7, and the control systems of buildings can be operated remotely in response to real time information.

## Vital networking

To keep ahead of technical developments Uponor plays an active role in national industrial associations and international networks including ENCORD (The European Network of Construction Companies for Research and Development) and REHVA (The Federation of European Heating, Ventilation and Air-conditioning Associations).

“We also get actively involved in initiatives set up to shape new standards and legislation – as well as collaborative research programmes run in different countries on themes related to energy and water, including projects run by the WANDER Nordic Water and Materials Institute looking at the impacts of materials on drinking water quality,” explains Hirvonen. Cooperation with technical universities and research institutes also helps Uponor keep up with the latest scientific developments on materials and manufacturing processes.

All of this collaborative research provides valuable knowhow to help Uponor develop new solutions. “The related networks also give our reps a chance to get together with researchers, planners and building design-

ers to look at trends, opportunities and coming changes in regulations and standards, and share our ideas and visions,” adds Hirvonen.

## Prospects in plumbing

**ALAR KOTLI**, Uponor’s Plumbing Application Manager for Europe envisages that over the next 10-20 years the focus on sustainability issues will intensify. “This will bring into the markets new plumbing solutions and technologies designed to save water, as well as a wider use of in-house water recycling systems and automatic water leakage indicators with automatic shut-off functions to prevent water damage while occupants are away,” he says.

Kotli emphasises that hygiene issues are also becoming ever more important in relation to total plumbing system design and installation, as well as materials in contact with drinking water.

One key challenge is that different standards are applied in different regions.

“EU regulations are driving our product development towards sophistication, though other countries like the US, Japan and Korea are also toughening regulations for materials in contact with drinking water,” explains Kotli. “The consequent increases in product value are not always easily accepted in all markets. Asia is generally behind the EU on monitoring drinking water quality, for instance, so their expectations for plumbing product properties are more basic and price-centred, though this is rapidly changing.”

## Climate concerns

Looking ahead in the wider construction market, Esa Hirvonen feels that energy efficiency will become even more important as efforts to combat climate change intensify. Targets for buildings’ energy consumption are getting increasingly ambitious, especially in Europe.



All collaborative research provides valuable knowhow to help Uponor develop new solutions





## Grassroots feedback

One vital tool for development work is feedback from people working at grassroots level installing Uponor's products around the world.

"Our international Uponor Academy, through which we train thousands of installers in all of our main country markets, also acts as an excellent channel for feedback on practical issues with implications for product development," says **ESA HIRVONEN**, Vice President, Technology.

"In many countries we also run road shows for installers, giving us welcome contacts with people working out on construction sites."

"Innovative ways of thinking will be needed to meet these targets throughout building life cycles while keeping construction costs reasonable," explains Hirvonen. "Building constructors are already looking at alternative renewable energy sources, for instance. At the same time climate change itself could increase the need to cool buildings."

Hirvonen believes these trends will open up new opportunities for firms able to devise new solutions. "There will be increasing demand for products like Uponor's Thermally Active Building Systems (TABS) that are able to adapt to changing conditions, for example," he explains. "In modern office buildings the heat generated by computers and lighting often means that buildings need to be cooled during the day even during the winter; but with a carefully planned TABS installation, excess heat can be stored in internal structures and then discharged at night either back into the building itself or to a natural heat sink, thus significantly reducing the energy costs of cooling."

### Profitable partnerships

In new-build contexts Uponor's offerings invariably form part of larger packages of products and systems. "This makes it important for us to build partnerships with firms offering products that complement ours – as well as with planners and installers," says Hirvonen. Such partners might include firms providing information and control systems, maintenance services, or heat pump technologies.

Speed is increasingly of the essence in construction projects. Hirvonen feels that in future it may become more common to use high quality ready-made building modules manufactured off site in controlled conditions, incorporating products made by various partner companies.

"Partnerships can be challenging, and learning curves steep. One plus one must equal more than two," says Hirvonen. "From our side, Uponor can bring to partnerships our state-of-the-art knowhow on heating, cooling and drinking water systems."

## In search of innovations

To facilitate the goal of identifying tomorrow's game-changing products, Uponor created a new channel in North America, enabling innovators from outside Uponor to bring their ideas to the company with a view to collaboration on business ventures.

"At Uponor Innovations we're generally looking for ideas related to our traditional market areas of residential and commercial plumbing and heating – though our focus also includes sustainable concepts for other aspects of human environments," explains **BRAD BECKMAN**, Uponor North America's VP, Finance.

Uponor Innovations are open to ideas from all kinds of people, including entrepreneurs engaged in advanced product and technology development, the owners and management teams of other businesses, and investors. "We're especially seeking ventures where we can contribute Uponor's expertise in engineering, manufacturing, distribution, sales and marketing to help take ideas, products or businesses to markets they might not otherwise reach," adds Beckman.

Proposals are submitted via Uponor Innovations' user-friendly website. Beckman has already been greatly encouraged by the initial submissions received since the scheme was launched in September 2013.

See [www.uponorinnovations.com](http://www.uponorinnovations.com)

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