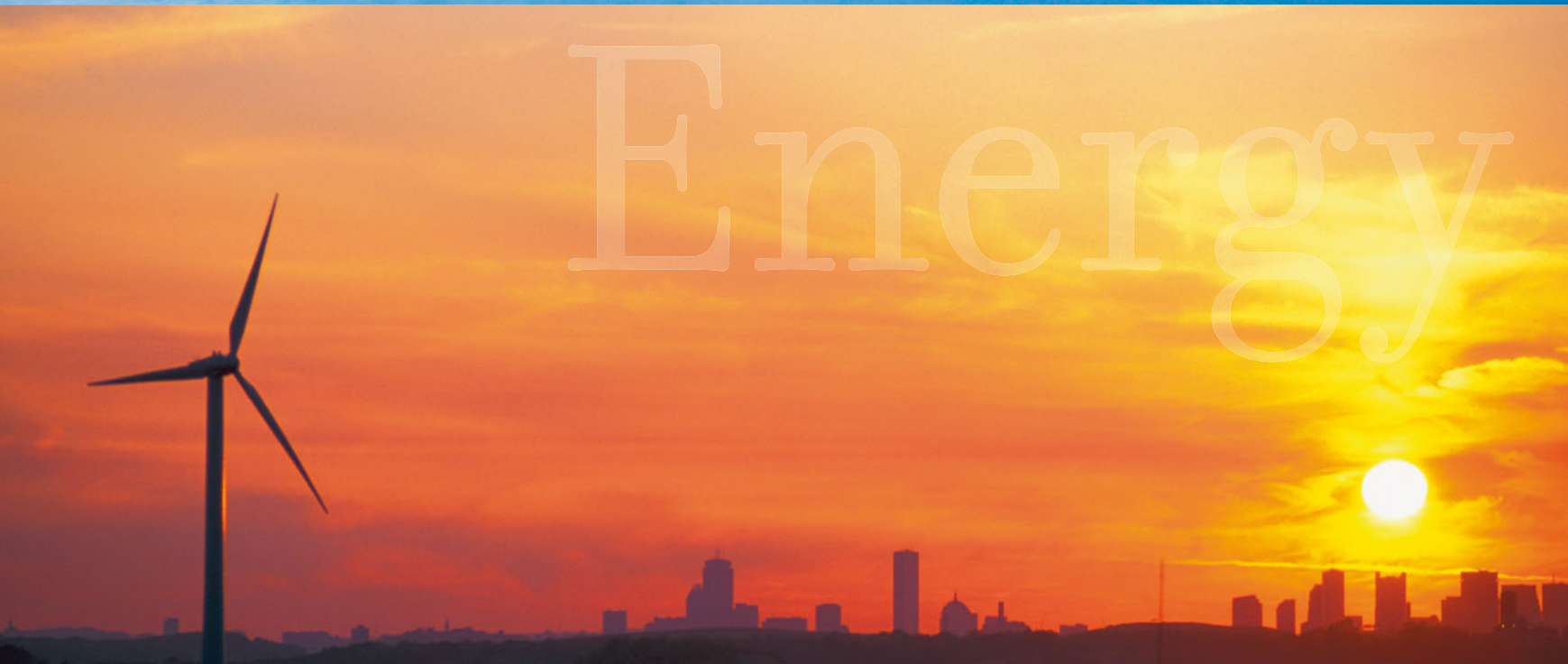


Megatrends are shaping the future of building

YEARBOOK 2012

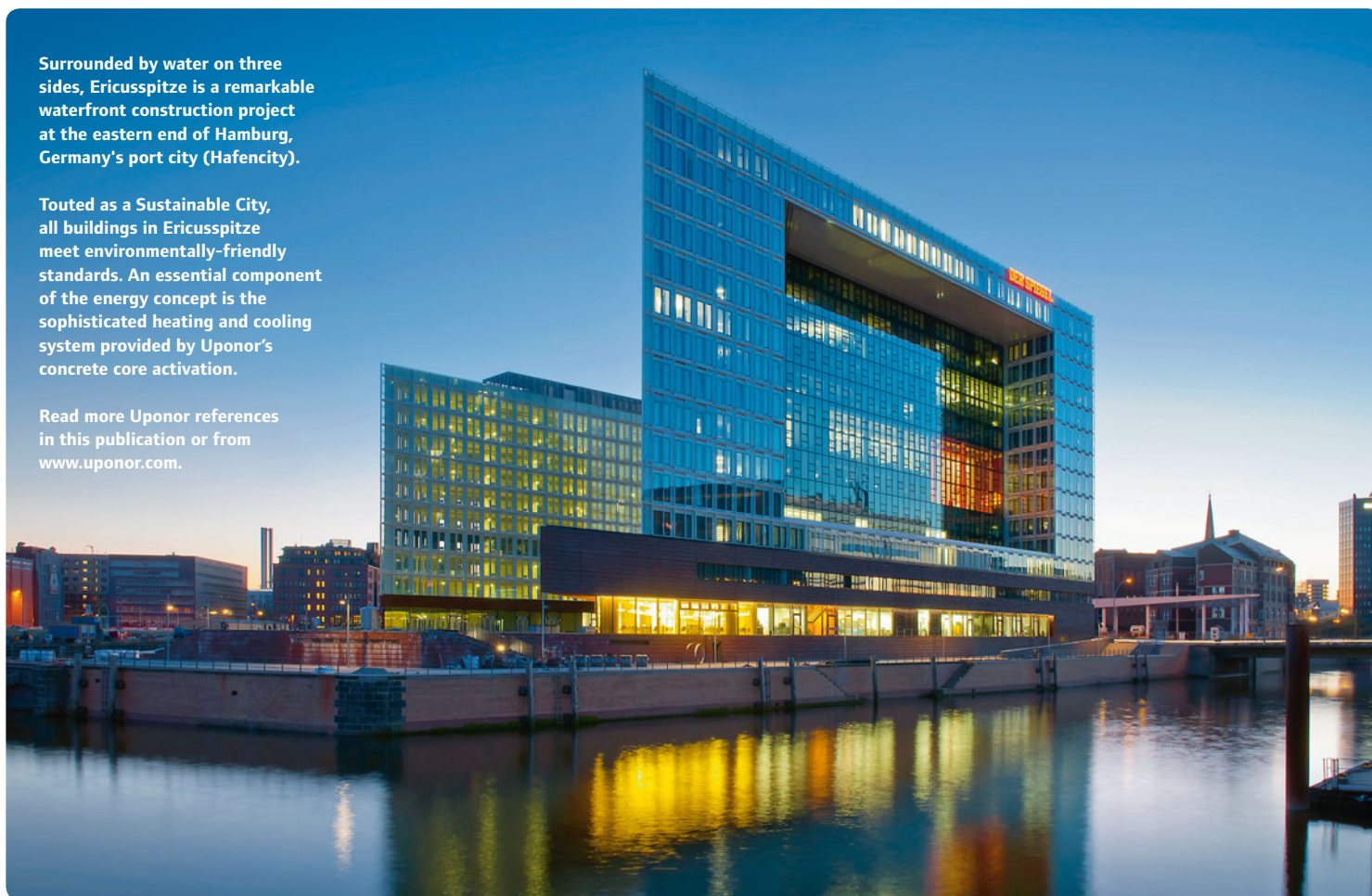


Surrounded by water on three sides, Ericusspitze is a remarkable waterfront construction project at the eastern end of Hamburg, Germany's port city (Hafencity).

Touted as a Sustainable City, all buildings in Ericusspitze meet environmentally-friendly standards. An essential component of the energy concept is the sophisticated heating and cooling system provided by Uponor's concrete core activation.

Read more Uponor references in this publication or from www.uponor.com.

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Foreword

THE WORLD is in flux and people's needs and habits are changing with it. Financial reporting is becoming more versatile, with companies implementing new ways to communicate with their key target groups, along with regulatory disclosure.

THE PUBLICATION now in your hands – *Uponor Yearbook 2012* – is the latest addition to our investor information package. Instead of focusing on the past, this publication provides a glimpse into the future: the current year and beyond. The aim is to look further than short-term quarterly or annual performance, and to focus on businesses and business drivers that impact Uponor's performance in the longer term. Some of these trends are significant, and form the basis for our long-term strategies, creating strengths to guide us as a company, and putting us on a path towards sustainable and profitable growth. For investors, what could be more important than future expectations and plans?

If you are reading this publication and are not an investor, I hope that you are a customer, a partner, or similar stakeholder who has a vested interest in following Uponor.

WE HAVE ALSO sharpened our approach towards financial reporting. Mid-February 2012, we published *Financial Statements 2011*, a concise financial report that presents all the regulatory data which a public company

must disclose to its shareholders and the investors in general. In addition to the official, audited annual accounts, the report contains other relevant investor information, such as the *CEO's Letter to Investors* and *Information for Shareholders*, comprising key financial and sustainability performance information for the year 2011.

DESPITE THE RATHER weak economic situation, the times ahead are interesting and challenging. With many global megatrends working in our favour, Uponor is well prepared for the future.

Thank you for taking the time to read this new publication. We welcome your feedback, so feel free to let us know what more you would like to learn about Uponor.

Sincerely,

Tarmo Anttila
Vice President,
Communications

Contents



4

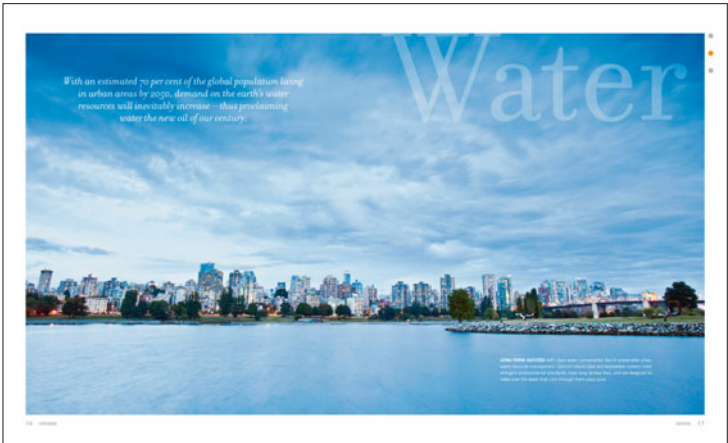
Energy

- The green agenda.....6
- Exergy aware.....9
- Low-energy:
high-impact mandate.....10
- Blueprint for the future.....14

Water

16

- Thirsty for sustainability.....18
- A flexible favourite.....22
- Proof in the numbers.....26
- Boosting value
through partnerships.....27
- Renovation drives
green initiatives.....28
- Modern living.....31



Business


- Human touch
delivers innovation.....34
- Uponor builds upon
a sustainable strategy.....38
- Keeping promises.....40

32



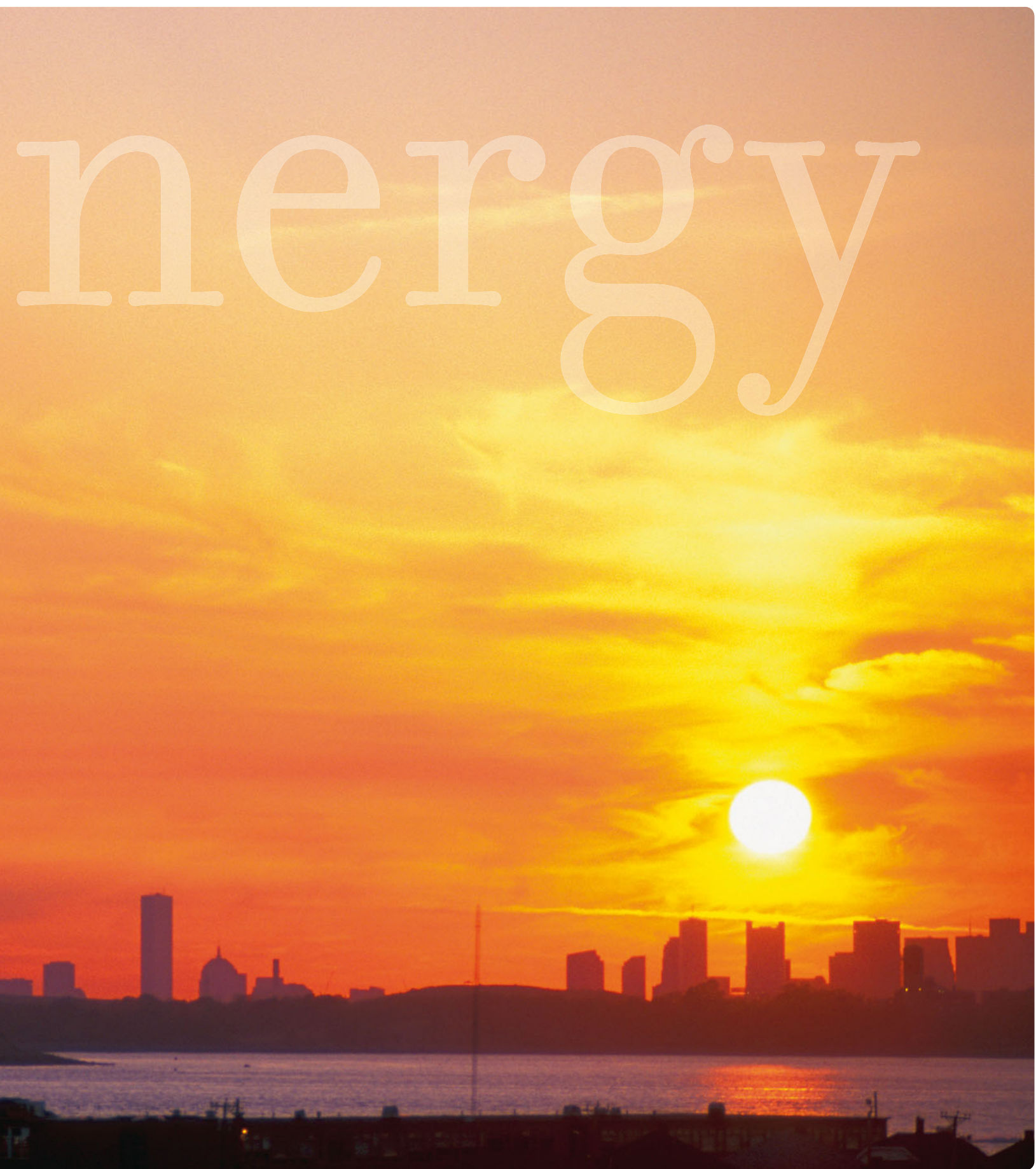


Buildings account for two-fifths of all the energy consumed globally, and this share is predicted to reach 60 per cent by 2040.



THE CONSTRUCTION INDUSTRY is taking heed of these numbers and focusing attention on implementing sustainable building practices. Uponor considers this megatrend to be a genuine driver for creating more opportunities to improve the quality and performance of buildings with their products and solutions.

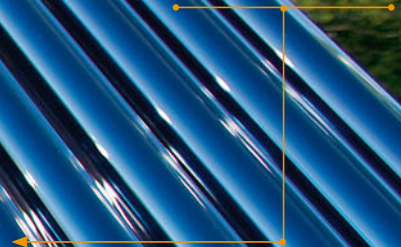
energy



One-third of the world's primary end-use energy consumption is associated with heating, ventilation, cooling, and lighting.

33

Solar collectors are designed to collect heat by absorbing sunlight. They can be integrated into or attached to a structure and used to heat or cool an entire building.



The green agenda

SUSTAINABLE CONSTRUCTION, ALSO COMMONLY REFERRED TO AS GREEN BUILDING, IS A HOT TOPIC. CLIMATE CHANGE AND OTHER ENVIRONMENTAL CONCERNS ARE VERY MUCH PART OF THE PUBLIC DEBATE WHEN IT COMES TO SHAPING OUR TOWNS AND CITIES.

Environmental issues are not the only driver behind green building. Economics also plays an important role. In most cases it is the financial benefits that really make change happen.

“Green building clearly makes economic sense if we compare the costs against the long-term costs of not building eco-efficiently,” says **Dr. Raymond Cole**, a Professor of Architecture at the University of British Columbia, where he has taught students environmental issues in building design for more than 26 years.

Eco-efficiency adds significantly to the value of a building, and is becoming a key factor for real estate investment. Surveys reveal that in Finland and Switzerland, eco-efficient solutions can add about seven per cent to the value of a building.

THIS TREND is likely to reshape the construction industry in due time. Sustainability will ultimately be measured by economic, social, and cultural standards, as well as environmental yardsticks. The sustainability performance of buildings will be looked at holistically, considering their overall usability and wider cultural consequences. There may be a shift away from individual eco-efficient buildings towards the concept of entire eco-cities.

Dr. Cole believes that the idea of regenerative design should take precedence. “Regenerative design introduces a positive philosophy in that it gives back more than it takes, in contrast to the emphasis in the

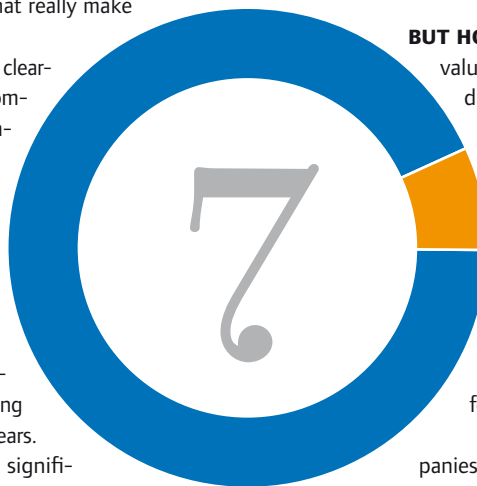
past on merely doing less harm,” he says. “In this way, regenerative design builds up social and natural capital,” Dr. Cole says.

BUT HOW DOES this financial eco-value work? **Jukka Noponen**, director of a major energy programme run by Sitra, the Finnish Innovation Fund, believes that for companies whose products are intangible, the way they manage their real estate has a strong symbolic value. Their premises can reflect what their brand stands for.

“It is difficult for such companies to show their determination to follow the rules of sustainability, and corporate and social responsibility in any other way than through their real estate,” explains Noponen.

It is especially important for global companies to be seen as acting responsibly. Real estate developers can cash in on this. “If real estate developers construct properties in ways that are attractive to global companies, they will be able to ask for substantially higher rents,” Noponen tells.

IN PRACTICE, eco-efficiency means finding green solutions for every stage of a construction project, and crucially also for the performance of the finished building. Smart electricity grids and smart metering, for instance, can encourage residents to make their energy use more sustainable. Solar collectors can be integrated into a building, and whole buildings could even be designed creatively, applying biomimicry in their architecture, with nature itself as the model.



Eco-efficiency adds significant value to real estate. In Finland and Switzerland, eco-efficient solutions add about 7 per cent to the value of a building.
Source: NUWEL-Workinggroup, 2011

"Green building is a natural process. A concept is first pushed forward using sticks and carrots, when demand for it increases, then the idea evolves into a regular market offering."

Technology is developing fast, and the possibilities are endless. The most crucial limiting factor may be the attitudes of the people working in construction.

To achieve genuine sustainability, it is important to look collectively at the wider built environment rather than just the individual building. "Looking at a building separately leads to sub-optimisation. Nature itself takes in the big picture for whole ecological systems," adds Dr. Cole.

UNTIL RECENTLY, the main driving forces behind sustainable green building were a few pioneers and legislative controls stemming from worries about climate change and declining natural resources. Now, thanks to a greater understanding of financial eco-value, green building is becoming part of the market economy.

"This is a natural process – first a concept is pushed forward using sticks and carrots, then demand for it increases, and finally the idea continues to evolve as a regular market offering," says Noponen.

BUT FOR THIS development to take hold, ordinary people must buy into the idea. This means there has to be a more profound change in the way people think about a built environment.

"There have to be benefits ahead for companies who choose to look at the wider picture of green building, but we can't legislate our way to a sustainable future. People must collectively buy into new kinds of community development. Financial incentives and taxes won't be sufficient," Dr. Cole says.

Green building is becoming part of the market economy.

This movement at the grassroots level is already happening – with people increasingly wanting to engage with their local environment and support sustainable developments. "I believe the rapid emergence of social networks has great potential for generating environmentally positive changes in the built environment," adds Dr. Cole.

But as with food production, there is one great challenge to conquer before sustainable, innovative building processes become the norm. Production costs must fall sufficiently, and demand needs to increase. In a kind of Catch 22, demand will not grow until costs decline. For now, many sustainable products remain only in reach of a few people, most typically those at the upper end of the income scale.

North America is today a forerunner in green building and technology, but as in many other fields where innovation is central, China is catching up fast. With its more than one billion inhabitants and unprecedented urbanisation, China needs to take sustainability seriously. "For purely environmental reasons, China needs to put a lot of effort into building green, sustainable cities," says Noponen.

IN EUROPE, eco-districts will more likely spring up inside existing cities where areas such as former harbours and industrial areas are redeveloped.

In the future, it will not be enough to build a few exclusive sustainable buildings. Buildings and cities will have to generate positive impacts. Individ-



ual buildings could be designed to generate more energy than they use. Regenerative design and biomimicry could provide useful frameworks for such developments.

"This requires a new attitude, but creative and positive thinking is inspiring," says Dr. Cole. "Such approaches support the co-evolution of human and natural systems in partnered relationships."

All these changes, from the adoption of new mindsets at the grassroots level to the spread of eco-cities and innovative sustainable technologies, should serve as a green light for businesses aiming

to succeed in the markets. If companies working in construction can follow such trends and start to see their task more holistically, the economic, cultural, and social consequences could be profound – to say nothing of the environmental benefits.

"The costs to society of not doing this will ultimately be far in excess of the costs of the necessary investments. But the general public isn't there yet. Short-term thinking still abounds. We should be asking how we can afford not to build green," concludes Dr. Cole. «

EXERGY AWARE

ONE-THIRD of the world's primary end-use energy consumption is associated with heating, ventilation, cooling, and lighting. There is, therefore, great savings potential in both the amount of energy and the quality of the used energy – the exergy.

By utilising low-exergy design, the use of renewable energy sources in buildings can be enhanced in an efficient way. Low-exergy design incorporates a system where the quality of input energy matches to that of the quality required in the output, and is something radiant systems can utilise.

"RADIANT systems are future-proof because they are based on low-exergy design. Whatever future energy sources there may be, these systems can uti-

lise them. Through the implementation of low-exergy design, we can gradually integrate renewable energy into the building stock. Replacing high-temperature heating systems with low-temperature systems will increase overall energy efficiency, and at the same time, integrated energy design will allow high-temperature cooling utilising free sources," comments **Lars Nielsen**, Marketing Manager of Indoor Climate at Uponor.

THE BENEFITS of low-exergy systems and integrated energy design are already in practice. The efficient energy conversion of a radiant system results in an overall decrease in CO₂ emissions for commercial structures. Radiant systems are easily integrated

with alternative energy sources (geothermal, solar, waste) and free sources of energy like biomass. The water in a radiant system has the capacity to transport energy 3,500 times greater than air, so it can transport heating and cooling using less energy than a forced-air system. In radiant systems, fans are typically only needed for the remainder of the sensible load ventilation and humidity control. This can reduce needed air movement volume and mechanical equipment size by up to five times, and also reduce fan power and duct size.

The challenge is to ensure better collaboration between the involved parties at an earlier stage of construction – most markedly during the planning phase.

Low energy: high-impact mandate

IMAGINE A HOUSE SUPPLYING ITSELF WITH ENERGY,
AND UTILISING RENEWABLE TECHNOLOGIES TO CREATE A HEALTHY
AND COMFORTABLE HOME YEAR ROUND.

The building structure incorporates a radiant heating system, and there is an integrated system to ensure proper cooling and heating. The roof has solar collectors, while the exterior is smartly shaded to keep it cool. This isn't the house of the future – this is the house of now.

These energy-smart buildings go by a variety of names – low energy, passive house, active house. When it comes to their energy sources, technology can positively impact indoor environmental quality. Uponor designs solutions to reduce the negative impacts, while emphasising long-term sustainable performance.

As **Lars Nielsen**, Marketing Manager for Indoor Climate at Uponor explains, a low-energy building, in its simplest form, requires increased insulation and better building tightness to reach the targeted reduced net-energy demand. Ventilation with heat recovery is also a necessity. The challenge is to provide the reduced, but still required heating in an energy-efficient way; while keeping in mind the ventilation requirements.

“THE PASSIVE HOUSE concept has proven successful in providing single-family houses with very low net energy needed for space and ventilation heating, although there are remaining issues to be resolved for user comfort, indoor climate, and energy optimisation,” Nielsen says. “Yet at the same time, the passive house concept is being challenged by a new vision.”

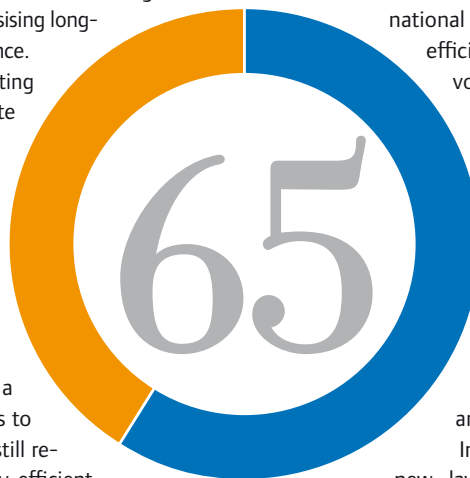
The active house framework defines the next generation of sustainable building. An active house focuses on the well-being of the occupant by optimising a balance between energy, indoor climate, and environment. People spend approximately 65 per cent of their time inside the home. Therefore, the quality of the indoor climate should be considered carefully.

BUT IT'S NOT JUST homes that are becoming more low energy. Office building standards are moving in the same direction, in accordance with national laws requiring more energy-efficient buildings. In addition, voluntary certification schemes (LEED, BREEAM, DGNB) offer a label for sustainable building design, construction, and operation. With environmental issues in the news daily, people are looking to all areas of their lives to reduce their own energy consumption, and this includes their homes and workplaces.

In the European Union (EU), new laws are making sustainable building a demand, not a choice. Buildings in the EU account for 40 per cent of energy use and 36 per cent of CO₂ emissions. More than 90 per cent of the environmental impact from a building is from its energy use – heating, cooling, ventilation, hot water, and lighting. Improved energy efficiency is vital to reducing costs and improving competitiveness, as well as guaranteeing future energy supplies and meeting international climate change commitments.

“Strict building code requirements can be met by

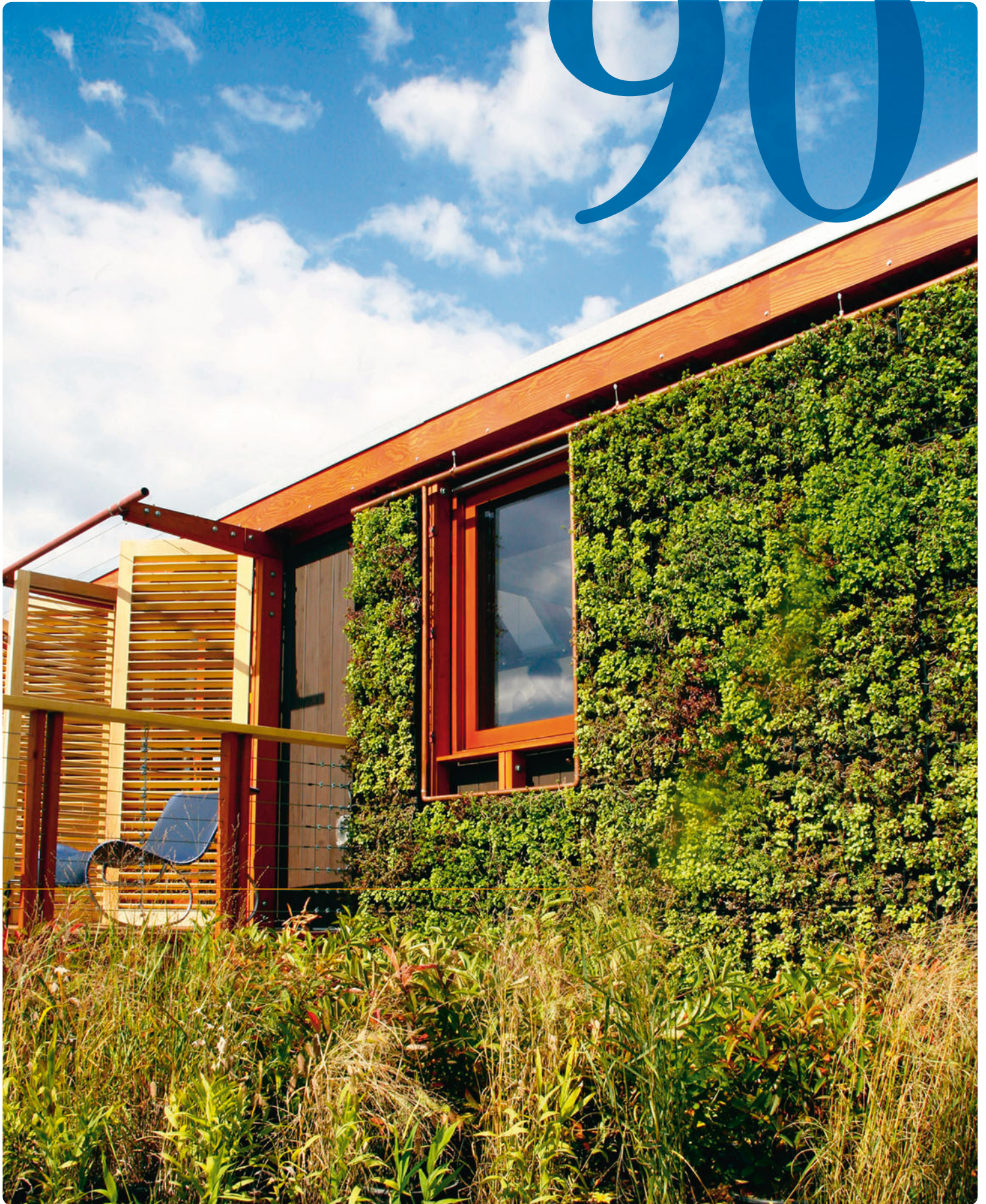
People spend approximately 65 per cent of their time inside the home.



People are looking to all areas of their lives in order to reduce their own energy consumption, and this includes homes and workplaces.

More than 90 per cent of the environmental impact from a building is from its energy use.

90



utilising free energy sources from ground energy or the sun using solar thermal energy,” adds Nielsen. “Uponor systems are well suited for such renewable sources. Most building codes adopt the concept of primary energy which favours energy-efficient systems – also an area where Uponor’s heating and cooling systems can play a significant role.”

MYTHS ABOUT low-energy buildings are numerous. Too hot. Too cold. Strange materials, bad air, mould.

“The challenge – and opportunity – that we have is to demonstrate that houses can be low energy and at the same time comfortable and cost efficient,” comments Nielsen.

Lack of comfort in a low-energy building is not because of the low-energy concept itself, but is due to poor engineering and design of the indoor climate systems. Increased insulation and airtightness often lead to fears of respiratory problems. Distribution of heat in the wrong places creates discomfort. Uponor counters these with enhanced ventilation systems. Radiant heating and cooling increases comfort and works well with sustainable energy sources. The ideal vision is one of a holistic system that is capable of managing heating and cooling, and integrating the ventilation and heat pump systems. This integrated solution addresses all the concerns about energy sources and consumption, as well as ensuring a pleasant indoor climate.

A LOW-ENERGY building begins with the site and building orientation. Once a structure is built, better energy performance is realised by controlling and optimising all the energy flows in the building, with a focus on increased thermal insulation, energy-efficient windows, airtightness, heat recovery ventilation, and renewable energy technologies.

“Uponor’s systems and solutions are tailor-made for the low-energy and sustainable built environment,” says Nielsen. “Our building integrated systems allow both heating and cooling with the best possible utilisation of the available energy resources. This helps reduce primary energy consumption as well as carbon emissions.”

Convincing people to invest a bit more in a pleasant living environment isn’t always easy. “A low-energy single-family home can be built with an air-to-

air heat pump as the only heat source for the ventilation system. This will, in most cases, be the system with the lowest initial installation cost,” Nielsen explains. “But this solution will suffer from poor energy efficiency and inappropriate indoor climate and will not be the cheapest in the long run.” He adds that a water-based system will guarantee a much higher energy efficiency and better comfort which translates into the better option, not to mention the most cost efficient over time.

New laws are making sustainable building a demand, not a choice.

WHILE UPONOR is a frontrunner in low-energy concepts, to maximise the benefits, the company looks to close co-operation with the construction industry, suppliers, and the end user. Because of ever-changing building requirements and environmental objectives, Uponor keeps fully informed of new regulations, and tailors products to meet demand.

“Our low-temperature heating systems improve the performance of heat sources and are the perfect match for renewable energy such as solar and ground energy,” Nielsen says. “Together with our intelligent Dynamic Energy Management (DEM) controls, an Uponor floor heating and cooling system is the perfect solution for future low-energy homes.”

For commercial construction, Uponor is able to meet increasing sustainability requirements with innovative low energy heating and cooling systems for that sector. Nielsen offers thermally active building systems (TABS) as an example that combines with ground source energy.

“The systems reduce overall energy consumption and provide sustainable and free cooling in the summer,” he says.

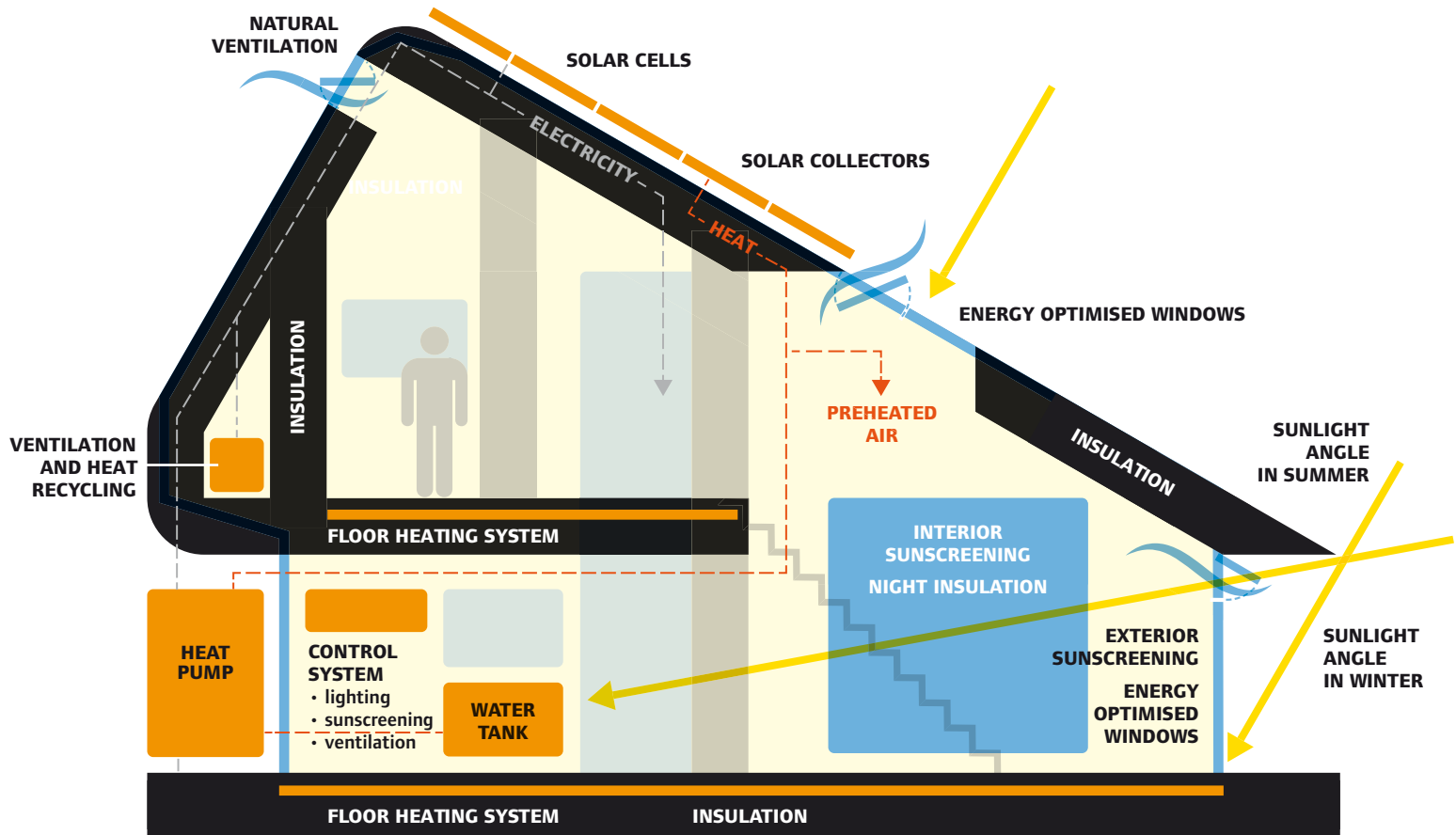
UPONOR IS EXCITED by the challenges of the constantly evolving sustainable building industry. The benefits are high – lower energy bills and lower environmental impact, to name just two – and the potential to be on the cutting edge in this area.

“The trend in single-family residences is to talk about the active house, and the trend in commercial buildings is to use labelling schemes such as the German sustainable building certification DGNB,” Nielsen says. “These aim at being much more comprehensive than merely addressing energy concerns and include all possible aspects of sustainability including the well-being of the inhabitants.” «

Radiant heating and cooling increases comfort and works well with sustainable energy sources.

An active house focuses on the well-being of the occupant by optimising a balance between energy, indoor climate, and environment.

ACTIVE HOUSE ENERGY CONCEPT



SOURCE: ELEMENTS OF ACTIVE HOUSE FROM HOME FOR LIFE DEMO HOUSE PROJECT; VKR HOLDING

ACHIEVING THE EU 2020 TARGET

IN 2002, the European Union passed the Energy Performance of Buildings Directive (EPBD) which decreed member states apply minimum requirements regarding the energy performance of new and existing buildings, ensure the certification of their energy performance, and require regular inspection of boilers and air conditioning systems in buildings. The EPBD of May 2010 introduced nearly zero-energy buildings (nZEBs), requiring all new buildings in member states to be nZEB from 31 December 2020 – with public buildings leading the way by being nZEB from 31 December 2018.

THE APPROACH Uponor has taken to assist its customers in meeting this directive is to actively follow the developments in energy legislation and building codes in each of their markets. “We are preparing ourselves for dialogue with our customers on how to build in line with low-energy legislation utilising systems that are both energy efficient and cost optimal, and at the same time provide the best possible indoor environment for the inhabitants and building users,” Lars Nielsen, Marketing Manager for Indoor Climate at Uponor sums up.

SELECTED NATIONAL TARGETS FOR NEW BUILDINGS

COUNTRY	TARGET
Denmark	• 75% by 2020 (base year 2006)
Finland	• Passive house standards by 2015
France	• By 2020 new buildings are energy-positive
Germany	• By 2020 buildings should be operating without fossil fuel
Hungary	• Zero emissions by 2020
Ireland	• Net-zero energy buildings by 2013
Netherlands	• Energy-neutral by 2020 (proposed)
Norway	• Passive house standards by 2017
UK	• Zero carbon as of 2016 (England & Wales)

Adapted from: SBI (Danish Building Research Institute), European national strategies to move towards very low-energy buildings, 2008

Blueprint for the future

AS SUSTAINABLE CONSTRUCTION GAINS MOMENTUM, COMPANIES ARE ALIGNING WITH PARTNERS TO CREATE BUILDING PROCESSES THAT ARE ENVIRONMENTALLY RESPONSIBLE AND RESOURCE EFFICIENT.

The National Renewable Energy Laboratory (NREL) in Golden, Colorado is the largest net-zero energy building in the United States. Opened in 2010, the Research Support Facility (RSF) showcases what is technologically possible.

"In designing and building the RSF, our aim was to move the needle in how America uses energy to heat and cool buildings," says **Paul Torcellini**, NREL Principal

Engineer. "It isn't enough to be energy-efficient when commercially viable technology exists to make buildings energy neutral."

AMONG THE ground-breaking innovations featured is a radiant heating and cooling system that gives maximum freedom for architectural and indoor design. A new term that seeks to define this sustainable way of designing and constructing commercial spaces is thermally activated building systems, or TABS.

The TABS system operates with Uponor PEX-a hydronic tubing for low-temperature radiant heating and high-temperature radiant cooling embedded in the structural concrete slabs.

TORCELLINI SEES more TABS-style buildings to come in the U.S. The system is already seeing popularity in European building. "Water is a much bet-

ter conductor of energy than air, and employing hydronic systems as a pathway for energy will be one of the strongest tools in rewriting our energy profile."

Uponor's TABS system cuts energy use by more than 50 per cent. Those energy savings, in turn, earned the building a LEED® Platinum certification from the United States Green Building Council.

IN A PROJECT that places high priority on efficiency at all levels, Uponor delivered significant up-front savings across the board.

A custom-designed installation tool allowed contractors to install eight times faster than conventional radiant tubing installation methods. The Uponor Radiant Rollout™ Mat is a prefabricated and pre-pressurised network of Uponor crosslinked polyethylene (PEX-a) tubing.

More than 67 kilometres of PEX-a tubing – subsequently prefabricated into numerous rolls whose dimensions were customised to match those of the RSF's various heating and cooling zones – enabled the mechanical contractor to slash labour time. Overall, 28 days were shaved from the construction schedule. However, the true day-savings was closer to 60 versus the time required for a conventional radiant installation.

"THIS WAS A REAL opportunity to sell an integrated solution rather than selling an element of the finished product," says **Devin Abellon**, Business

A crew of five people spent three months at mechanical contractor Trautman & Shreve pre-fabbing the radiant heating and cooling zones.

More than 67 kilometres of Uponor PEX-a tubing was installed in the Research Support Facility.

Uponor's TABS system cuts energy use by more than 50 per cent.

50



- USD 64 million facility
- Largest net-zero energy building in the U.S.
- Building size: 20,348 square metres
- Features Uponor radiant heating and cooling
- Increased campus square footage by 60 per cent
- Only increased campus energy use by 6 per cent
- LEED® Platinum certification

Development Manager at Uponor North America. "We worked closely with the engineer, mechanical contractor, and our local representative to develop and support a customised installation strategy that reduced installation time dramatically, and helped the project stay on schedule and within budget."

THAT PARTNERSHIP continues even after project completion. "We continue to work with NREL to monitor the performance of the radiant heating and cooling system," Abellon notes. "We're learning more

about how these integrated systems perform in real world conditions." Today, both NREL and Uponor

promote the project as an example of how integrated design can have a dramatic impact on overall building energy usage.

"People are beginning to realise what is achievable in

energy savings," Torcellini says. "We wanted to be leaders in the way buildings are designed, built, and operated. This was a truly progressive design-build strategy: we can't build better buildings using old models. Uponor brought innovation, and that delivered the added value." «

"This was an opportunity to sell an integrated solution."

With an estimated 70 per cent of the global population living in urban areas by 2050, demand on the earth's water resources will inevitably increase — thus proclaiming water the new oil of our century.



Water

LONG-TERM SUCCESS with clean water conservation lies in sustainable urban water resources management. Uponor's plastic pipe and wastewater systems meet stringent environmental standards, have long service lives, and are designed to make sure the water that runs through them stays pure.

Thirsty for sustainability

URBANISATION IS ONE OF THE GREATEST MEGATRENDS OF OUR TIME.

BUT WITH URBANISATION COME CHALLENGES.

HOW CAN CITIES MANAGE?

Currently, there are an estimated 20 megalopolises or cities with populations well over 10 million. By 2015, the number of megalopolises is expected to reach 23, according to the University College London (UCL) Environment Institute. In some cases – such as Istanbul and parts of London – urbanisation is happening so fast that cities cannot construct infrastructure fast enough to meet the needs.

“Urban areas are expanding,” says **Professor Peter A. Wilderer**, an expert in the field of urban water management and its ecological and social consequences, and the winner of the 2003 Stockholm Water Prize. “People are moving into cities in large numbers. More than half of the world’s population currently lives in cities, a number expected to reach almost five billion in the next 20 years.”

This will not happen without challenges. The drift towards urbanisation will cause social problems such as urban decay and greater social and economic inequality. But it is the environmental effects that will be the worst.

WATER IS THE KEY element for survival. Therefore, providing residents with access to clean water and sanitation is essential.

Megalopolises take up about two per cent of the world’s area. Yet, they create 80 per cent of the carbon dioxide emissions and use 60 per cent of the world’s water resources. This makes water one of the primary issues of the future.

Before we begin to solve the challenge, we should critically assess the methods traditionally used for urban water supply and sanitation. Building modern water systems often requires massive investments.

Water systems need constant development and maintenance. However, infrastructure is often not a high priority for cities.

Uponor’s **Bo Sørensen**, a stormwater management expert from Denmark, foresees that in the coming years we will see a marked change in rainwater management due to changes in global climate.

“The intensity of rain has increased, so we must build in more safety factors when designing a rainwater system, compared to five years ago. We have seen many problems in handling water flow.”

The risk of excess rainfall is that it will increase the risk of flooding cities. Of particular concern is the rise of the groundwater table to the surface after a long period of heavy rainfall. The soil becomes too saturated to absorb more water. The result is the flooding of property and infrastructure, contamination of drinking water, and the risk of disease.

THIS IS WHEN the problems caused by the lack of infrastructure become more prevalent. “We don’t invest the needed money to build out and maintain piping systems in cities,” says Sørensen. “In Denmark, they are increasing the amount of money invested in building out piping systems, for both wastewater and storm water, and maintaining the water supply.”

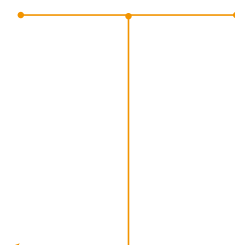
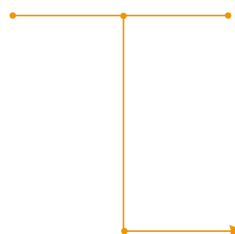
Providing proper water drainage for infrastructure systems is crucial. When building a road, a drainage system is installed so that the stability of the road is not undermined during storm events and flooding. Such systems are often lacking in cities, a concern that is not remedied without appropriate action by city councils.

Wilderer thinks the main challenge of urbanisation is providing enough clean water for human

The need for sustainable water management influences all stages of our development.

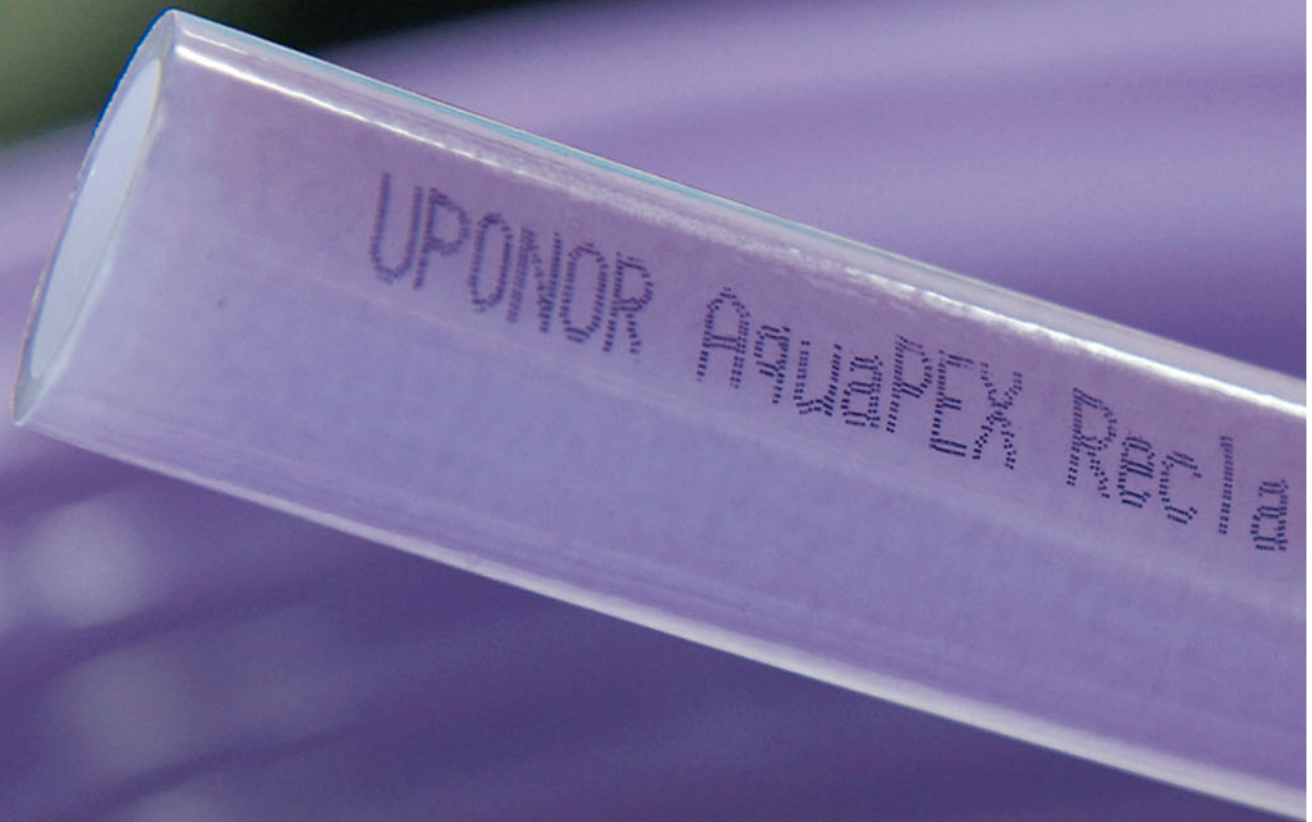
The world’s growing population means a spike in the amount of waste that needs to be managed safely. Wastewater removal from cities today uses the same technique developed by the Romans some 2,000 years ago.

According to various water research agencies, the world water use is expected to triple in the next 50 years.



95

Ninety-five per cent of urban population growth by 2025 will be in developing countries.



RESOURCE RATHER THAN RESTRICTION

WITH POPULATIONS continuing to grow and freshwater resources continuing to diminish, there is a need to rethink the way we utilise greywater — wastewater generated from domestic activities such as laundry and washing up, as well as from rainwater.

Interest in reclaimed water systems is increasing and building professionals are taking steps forward towards installing alternative ways to manage greywater.

In a greywater system, water is captured in a holding tank where it goes through a filtering process. A specially designated purple tubing — the industry standard colour for reclaimed pipe — distributes the filtered, reclaimed water from the holding tank out to laundry, toilets, and irrigation systems.

Greywater makes up about 70 to 90 per cent of residential wastewater. As

more and more communities stress extending water supplies, reclaimed water systems play a greater role in water resource management. The benefits are both economic and environmental. Reclaimed water systems can be installed at minimal additional cost than traditional plumbing systems. And reclaimed water tubing incorporates sustainable practices that comply with the requirements of green building certification.

Wastewater and rainwater purification facilities can supplement traditional methods of urban water management.

consumption. "If the capacity of natural fresh water resources gets too low to satisfy the actual needs of city dwellers, then alternative sources are exploited. Both rainwater and wastewater are such alternatives."

Traditionally wastewater is transported by means of buried sewers away from inhabited areas, sometimes across great distances, and discharged into natural water bodies.

"When we consider wastewater as a source of useable water, nutrients, and energy, discharging water is not a clever solution," Wilderer says.

Wastewater treatment is an area undergoing improved sustainable practices.

WASTEWATER TREATMENT is an area undergoing improved sustainable practices. Water protection, especially groundwater protection, is becoming more and more important. In regard to wastewater, strict regulations across Europe dealing with wastewater treatment must be followed.

Insufficiently treated wastewater contaminates groundwater. One of the biggest sources of load pollutants is phosphorous emissions into waters. Most treatment efficiency is only about 10 per cent for biological oxygen demand (BOD), and essentially non-existent for phosphorous and nitrogen nutrients. By contrast, Uponor sells products with a treatment efficiency of more than 90 per cent for BOD, 90 per cent for phosphorous and more than 50 per cent for nitrogen.

DECISIONS MUST be made within the context of best meeting the water supply challenge, Wilderer advocates. To him, this involves the use of decentralised, cost-effective small-scale wastewater treatment facilities and the reuse of the treated water for

toilet flushing, cleaning, watering plants, and human consumption. To get the treated water cost-effectively to the consumer, the wastewater purification plant should be positioned close to the point where the wastewater is generated.

"Rainwater is another potential source of useable water," Wilderer says. "It can be harvested from roofs, and stored either in containers, or in the groundwater reservoir underneath a city."

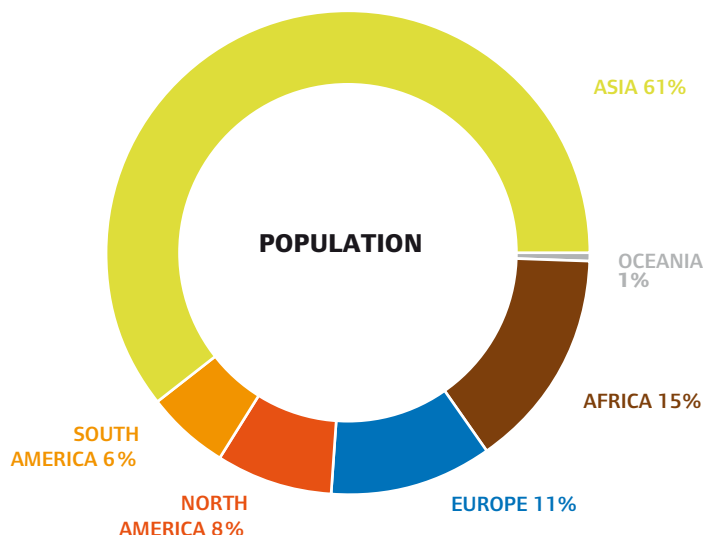
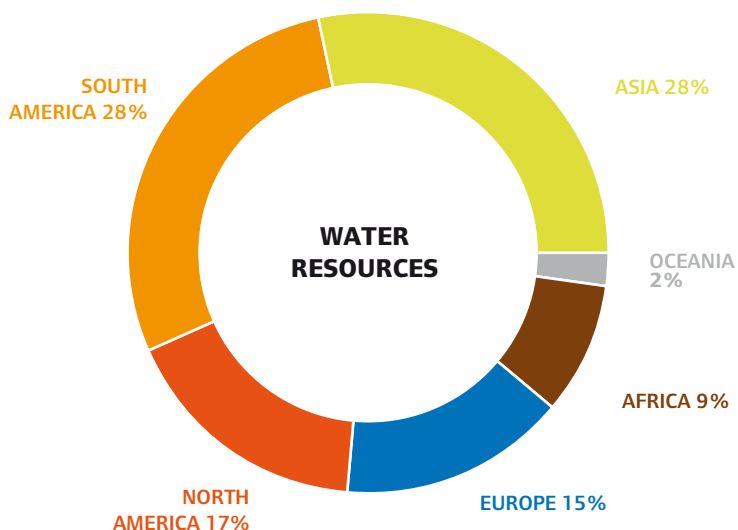
THE IDEA IS well expressed in what both Wilderer and Sørensen support for innovative stormwater management. Normally, stormwater is collected as run-off from roofs and roads and sent through a city's sewer system either to wastewater treatment plants or directly to rivers, lakes, or to the open sea.

"A better usage for the water is to infiltrate it directly into the ground to replenish the groundwater," Wilderer says. Sørensen adds, "We should handle rainwater as a resource rather than a problem we need to eliminate." When coming into contact with roof and road surfaces, the rainwater becomes polluted. Only after going through a filtration and ion-exchange process does it become usable for washing machines, toilets, and for watering plants.

Wastewater and rainwater purification facilities could readily be installed in newly built residential areas, schools, and buildings. In effect, such systems can supplement traditional methods of urban water management.

With the right approach – a mix of technology and co-operation – even urbanisation can be tamed. «

SOURCE: FAO.ORG



CONCERN FOR DIMINISHING WATER RESOURCES

A **WATER FOOTPRINT** assessment of a business maps the total volume of freshwater used directly or indirectly to produce a product or service throughout the various steps of its production chain.

Uponor is doing its part to challenge the way people think about water. In August 2008, Uponor and plastics manufacturer, Borealis, launched the first water footprint initiative in the plastics industry.

The two companies jointly calculated the total water amount required – from the manufacture of plastic resin to the installation of a pipe system – to construct a modern plumbing and underfloor

heating system for a standard 100 square metre Finnish apartment. Initial findings show that using 500 metres of Uponor PEX pipe requires some **29m³ (29,000 litres)** of water from cradle to home. The plastics material and pipe production account for one-third of the total water footprint of the system once it is installed.

ENVIRONMENTAL IMPACT is important. By understanding the water footprint, companies are able to address the global challenge and deliver sustainable solutions across the value chain.



A HAMBURGER **2.4m³ (2,400 litres)** of water



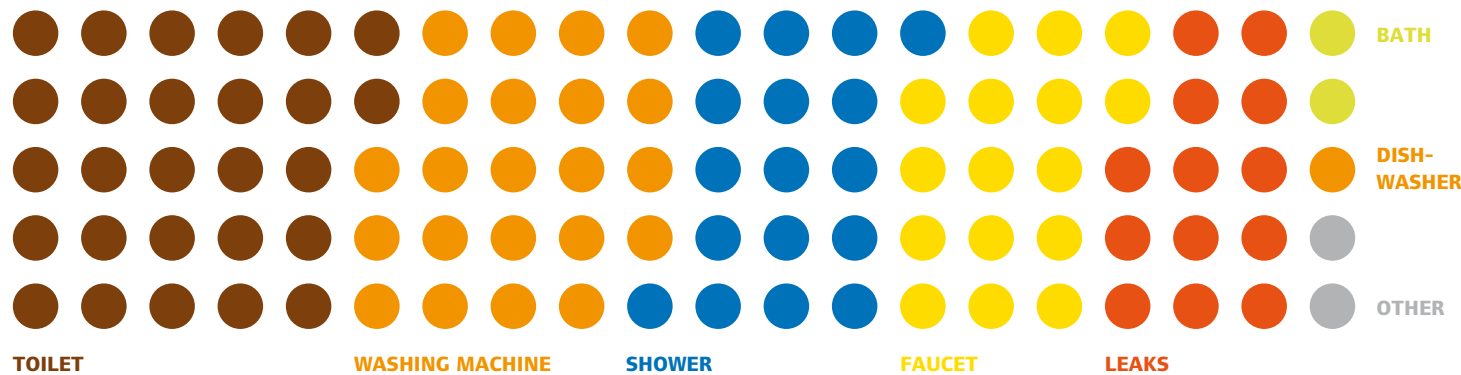
A PAIR OF JEANS **10m³ (10,000 litres)** of water



A CUP OF COFFEE **140 litres** of water

SOURCE: AWWA.ORG

BREAKDOWN OF INDOOR HOUSEHOLD WATER USE





Today in North America and Europe more than half of the plumbing pipes are plastic.

A flexible favourite

PLASTIC AND COMPOSITE MATERIALS ARE TRANSFORMING THE MARKET AND ARE WINNING MARKET SHARE FROM TRADITIONAL MATERIALS THAT WERE ONCE THE DEFAULT CHOICE FOR INDOOR PLUMBING SYSTEMS.

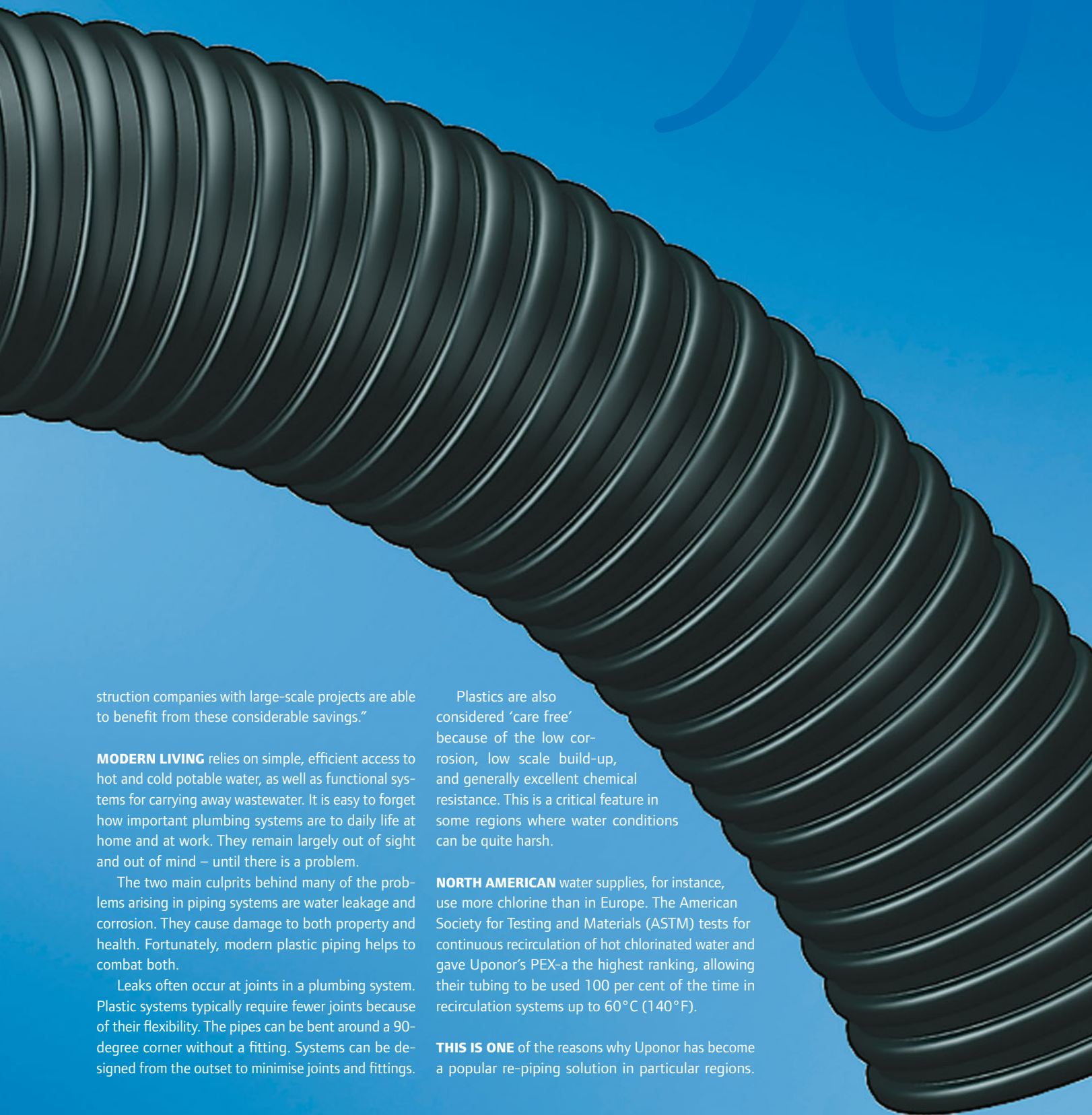
Fresh water, ironically scarce on our blue planet, is essential to human life. “The need for sustainable water management influences all stages of our development,” says **Esa Hirvonen**, Vice President of Technology at Uponor. “Maintaining water quality and improving water savings are key requirements in our choice of materials, processing, and design.”

While metal and concrete were once the primary materials for piping systems, plastic solutions such as flexible cross-linked polyethylene (PEX-a) tubing and multilayered composite pipe (MLCP) systems are steadily gaining ground, especially for household plumbing. Today in North America and Europe more than half of the plumbing pipes are plastic.

THE ORIGINAL driver for switching to plastic piping was the speed and safety improvements for installers. Plastic pipes are much lighter than metallic pipes, making handling on site easier. Lighter materials also cut transport costs, immediately reducing the carbon footprint. In North America, most requirements are still written for metallic pipe. Yet when the offers come in outside the customer’s price range, they start looking for other options. “Our fittings are expansion fittings. They require no glue, solvent, soldering, or torches,” says **Mike Rivers**, Associate Product Manager of Plumbing at Uponor North America. “So we cut costs as well as remove on-site risks such as an open flame.”

“Switching to plastics saves about 50 per cent in time and materials costs,” continues Rivers. “Con-

Plastic pipes can be bent around a 90-degree corner without a fitting.



struction companies with large-scale projects are able to benefit from these considerable savings.”

MODERN LIVING relies on simple, efficient access to hot and cold potable water, as well as functional systems for carrying away wastewater. It is easy to forget how important plumbing systems are to daily life at home and at work. They remain largely out of sight and out of mind – until there is a problem.

The two main culprits behind many of the problems arising in piping systems are water leakage and corrosion. They cause damage to both property and health. Fortunately, modern plastic piping helps to combat both.

Leaks often occur at joints in a plumbing system. Plastic systems typically require fewer joints because of their flexibility. The pipes can be bent around a 90-degree corner without a fitting. Systems can be designed from the outset to minimise joints and fittings.

Plastics are also considered ‘care free’ because of the low corrosion, low scale build-up, and generally excellent chemical resistance. This is a critical feature in some regions where water conditions can be quite harsh.

NORTH AMERICAN water supplies, for instance, use more chlorine than in Europe. The American Society for Testing and Materials (ASTM) tests for continuous recirculation of hot chlorinated water and gave Uponor’s PEX-a the highest ranking, allowing their tubing to be used 100 per cent of the time in recirculation systems up to 60°C (140°F).

THIS IS ONE of the reasons why Uponor has become a popular re-piping solution in particular regions.

"We have cases where the existing metallic systems did not last as long as expected due to exceptionally corrosive water in the area," adds Rivers. "Uponor's PEX-a tubing along with specially designed fittings make our plastic systems immune to such harsh water conditions."

Sustainability is fast becoming the dominant theme in all buildings, new and old alike. Aggressive goals are being set to help limit the impact of urbanisation on the environment. LEED certification in North America and the Green Mark in Singapore are just two instances of new standards in sustainability.

RECENT STUDIES of plastic pipe systems show they can make significant contributions towards sustainability, reducing the overall carbon footprint of plumbing systems versus more traditional methods.

"We have also been focusing on the inside surface of plastic pipes," says Hirvonen. "We can make the surface smoother than traditional materials, making water flow easier, thereby reducing the energy required to convey water."

THE BENEFITS of plastics are driving its adoption in the plumbing industry worldwide. That is not to say, however, that metal does not have its benefits.

To capture the sought after properties of both metal and plastic, Uponor has actively developed the revolutionary new multilayer composite pipe (MLCP) technology. Built from layers of metal and plastic, MLCP has brought additional key features to Uponor's offering.

Plastic pipe systems make a significant contribution towards sustainability.

"MLCP HAS the excellent chemical resistance of plastics and the lower thermal expansion of metals," explains Hirvonen. "It is form stable, meaning that when bent it stays in the new form. Bending can be done even without tooling. Its improved rigidity also means fewer fixings are needed, which reduces installation work."

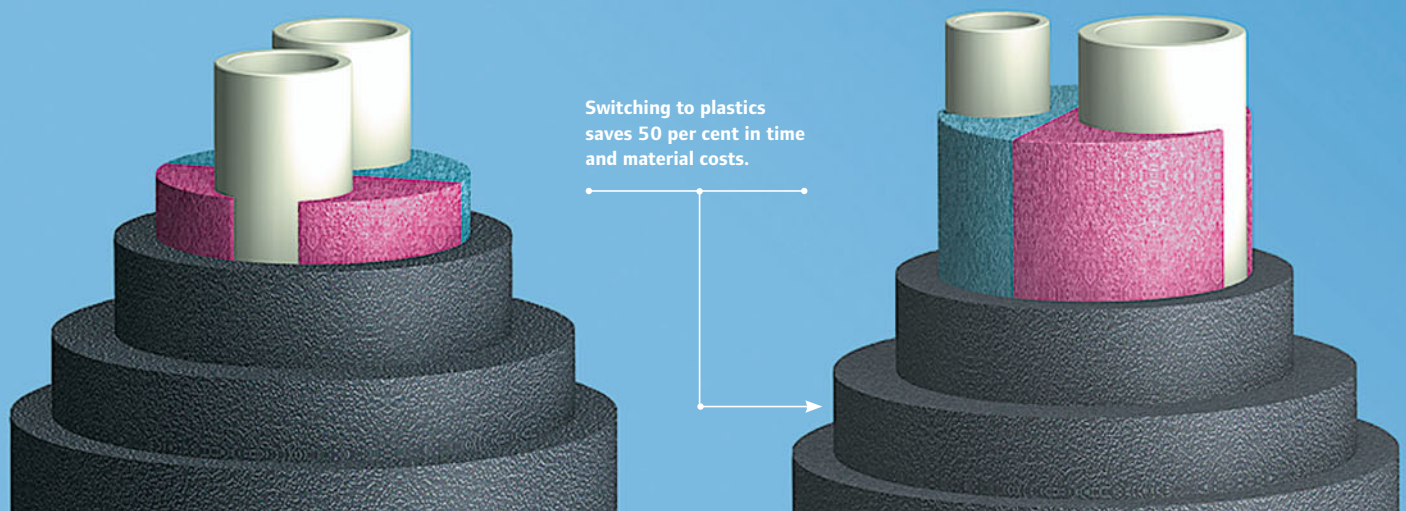
These and other features have been highly valued by installers. Introduction of the MLCP system has been an instant success.

Although still considered a relatively new material in some regions, plastic piping has been used for over fifty years. "We have a proven track record," says Hirvonen, adding, "these systems were originally designed for the standard 50-year lifespan, but we are seeing that many last even longer."

Creating sustainable plumbing solutions requires understanding the entire piping ecosystem. "We must have know-how of planning, installation, and operations of the total installed system," says Hirvonen. "These system-level performance criteria steer design and development."

"We continue to be a forerunner in the industry, developing solutions to meet ever changing demands," adds Hirvonen. "Through co-operation with our customers and partners, we are able to offer a complete package of systems, tools, and services."

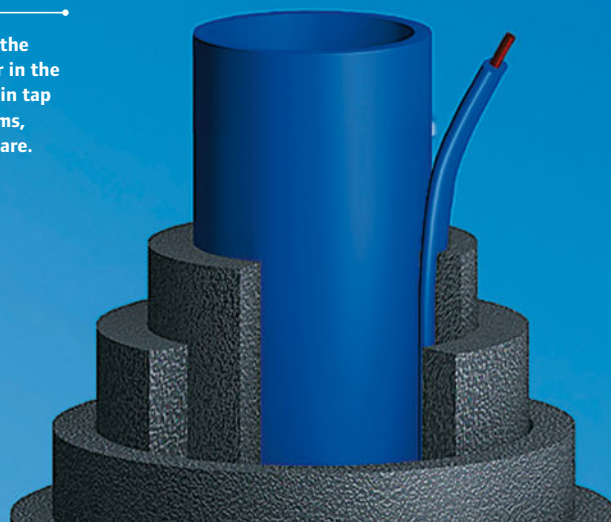
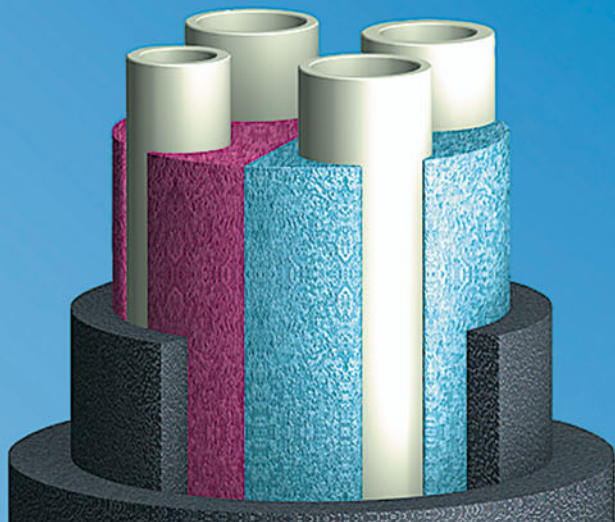
Maintaining water supply and quality is already difficult in some regions, and as populations grow, ensuring water security will only get more difficult. Sustainable water management will demand innovation and determination. «



IN THE UNITED KINGDOM only 28% of tap water systems use plastics. This is the lowest share of any of the EU countries and lower than in non-EU Norway and Switzerland.



BELGIUM is the European leader in the use of plastics in tap water systems, with 90% share.



SOURCE: PIPE MATERIAL SHARES IN TAP WATER SYSTEMS 2011; KWD



Proof in the numbers

Plastic pipe systems account for 60 per cent or more of pipes installed in Europe for floor heating, radiator heating, and sanitary systems. With the rising demand for sustainable buildings, the European Plastics Pipes and Fittings Association (TEPPFA) initiated a programme with the Flemish Institute for Technological Research (VITO) to conduct Life cycle Analyses (LCAs) for plastic pipe systems.

"LCA quantifies the potential environmental effects of a product over its life cycle, from extraction of raw materials to end-of-life treatment, consistent with the ISO 14040 and 14044 series of standards," explains **Carolyn Spirinckx**, Project Manager at VITO.

The four general application areas considered are water transport systems, residential hot/cold water systems, residential soil/waste removal systems, and sewer systems. Over one dozen LCAs have already been conducted, with the final studies to be completed during 2012.

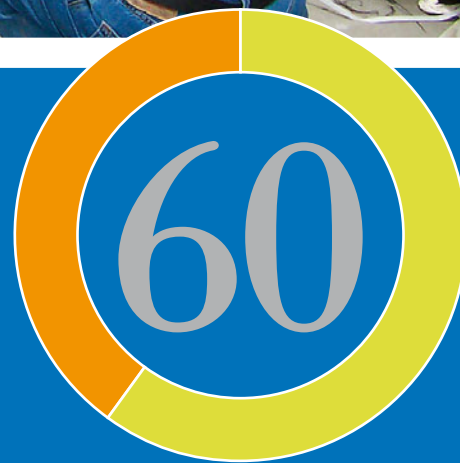
"In most of these cases, plastics outperform traditional materials, but not necessarily in every

phase of the life cycle," says Spirinckx. "In some comparisons, the impact from production is quite comparable, but something like transportation can be a huge issue."

In the case of a cross-linked polyethylene (PEX) hot and cold water system for a typical single-family apartment in Europe, the impact compared to copper systems is lower in all environmental categories, averaging 27 per cent of the copper values. A system based on multilayered composite pipe (MLCP) designed for the same apartment also shows lower impacts compared to copper, again less than 30 per cent.

To put this in everyday terminology, the carbon footprint of the PEX hot/cold water system is comparable to the impact of driving a typical passenger car five kilometres.

IN INFRASTRUCTURE applications, analysis of twin-wall polypropylene (PP) in a typical sewer installation showed on average only 29 per cent of the impact of a comparable concrete system. In the case of water distribution, a polyethylene (PE)



pipe system averaged below 20 per cent of the impacts of a ductile iron installation.

For each LCA, VITO is creating an official European Product Declaration (EPD) according to the European standards developed within the CEN TC 350 framework (Sustainability of Construction Works). The EPDs are a means for communicating to the broader community key facts about the environmental impact of a product (or system) used within or around construction work.

"The challenge for the construction industry will be to apply this information in the areas of innovative construction technologies, policy making, and communication," notes Spirinckx.



Boosting value through partnerships

The benefits of plastic and composite tubing are manifold, and with the right tools installers can capitalise on those benefits to an even greater extent.

Close co-operation with players in the industry forms an important part of Uponor's business success. Through these relationships, Uponor gains added expertise and can expand the value of its offering.

THE BEST partnerships are win-win relationships, and that is certainly the case with Milwaukee® Electric Tool Corporation. Not long ago, Uponor approached Milwaukee Tool to develop new tools that would make working with Uponor pipes and fittings even easier.

"Milwaukee Tool prides itself on delivering innovative solutions for the plumber," says **Corey Dickert**, Product Manager at Milwaukee. "When the opportunity arose to partner with a company that shared our passion, it was a natural fit."

The result is the new the M12™ and M18™ Cordless LITHIUM-ION ProPEX® Expansion Tools.

"The new tools offer continuous expansion, enabling a plastic pipe to contract easily around a fitting," explains **Mike Rivers**, Associate Product Manager of Plumbing at Uponor North America. "In addition, the tools have a considerably longer battery life, making installs faster and more efficient. The M12™ in particular has a compact right-angle design for an easy fit into tight workspaces."

THIS WAS an ideal development scenario where both sides collaborated to make a product that changes the game for Uponor installers. Utilising Milwaukee Tool's expertise in power tools and Uponor's engineering and application knowledge, the joint development led to a breakthrough product for both teams.

"The real highlight of this process was field testing with experienced Uponor plumbers and seeing their reaction," recalls Dickert. "At that point, we knew Milwaukee and Uponor had something special on their hands."

The partnership has been particularly successful for both Uponor and Milwaukee Tool. "Our re-

lationship with Uponor has not only allowed us to expand our reach through the products we develop for their systems, but has also given us the ability to stay ahead of the curve in an industry that is increasingly looking for alternatives to rigid pipe systems," notes Dickert.

"WITH EXCELLENT uptake in the North American market, Milwaukee Tools solutions are being introduced across Europe and are available in Iberia, France, Italy and the UK," adds **Ricardo Renteria**, Marketing Manager of Plumbing at Uponor. "The reception thus far has been excellent, especially in Spain where huge installer events were arranged to introduce the tools."

Uponor plans to bring the tools to the rest of Europe, heading east. "Customers in Russia, Poland, the Baltics and Southern Eastern Europe are looking forward to the launch in their respective markets. These tools are a real success story," states **Markus Friedrichs**, Business Group Manager at Uponor.

Renovation drives green initiatives

AS SOCIETIES CHANGE, NEW NEEDS FOR COMFORT AND ENERGY EFFICIENCY EMERGE. UPLIFTING A BUILDING LETS OWNERS MEET MODERN DEMANDS AND EXTEND THE VALUE OF THEIR INVESTMENT.


Buildings are getting older, which means renovation is increasing in importance. In Europe, a substantial portion of buildings are older than fifty years and many are hundreds of years old. More than 40 per cent of residential buildings in Europe were constructed before the 1960s. Figures for the U.S. are less dramatic. Approximately 30 per cent of housing stock is more than fifty years old, while only 15 per cent of commercial buildings are more than seventy-five years old.

"A large portion of commercial and residential stock is at an age where renovation is needed, both to extend the life of the building and to bring its use up to today's standards," explains **Ville Ruohio**, Unit Manager at Uponor in Finland. "With renovations, it is important to upgrade existing buildings while still maintaining their historical and cultural value."

AVOIDING LEAKS in plumbing is critical in the maintenance of an ageing building. Many older buildings have metal pipes with a life expectancy of less than fifty years. "In a number of countries, many of the building regulations require that pipes are installed in such a way that if a leak occurs, it is visible," says Ruohio. "But in older buildings, leaks are not necessarily seen and can soak into the construction materials, leading to mould and extensive repair. Replacing the pipes in time is imperative."

Uponor is a pioneer in using plastics for piping and offers its multilayer composite pipe (MLCP) solution for renovation projects. "Uponor MLCP pipes have the stiffness of metal, but with a service life that exceeds fifty years. They are also easy to install and meet strict drinking water standards," Ruohio points out.

IMPROVING ENERGY performance is another reason why customers choose to renovate. Buildings, especially older structures, are a significant source



Throughout Europe and the United States, building stocks are getting older, which means the importance of the renovation segment will continue to rise. The value of renovation construction exceeds the value of a new build. Moreover, in some countries, there is an urgent need to upgrade existing building stock to repair technical problems. But renovation is more than restoring a structure to good condition. As people's needs change, renovations are necessary to keep up with modern demands both for sustainability and comfort.



of carbon dioxide emissions. Wasted energy means not only higher utility bills, but also damage to the environment.

“Energy-efficient buildings are critical to creating a sustainable future,” notes **Ilari Aho**, Vice President of the Indoor Climate Business Group at Uponor. “Older construction makes up the vast majority of building stock, which means it is important to improve their energy performance.”

Currently, about one or two per cent of existing building stock in Europe is renovated on an annual basis. This figure may increase slightly, as more buildings get closer to the end of their technical or commercial lifespan. But even more importantly, the way in which renovations are carried out will change once European Union (EU) member states implement the Energy Performance of Buildings Directive. This process is still in its early stages, but as it continues, significant energy performance improvement requirements will be imposed on renovation projects across the EU.

“The Directive mentions, in particular, public sector buildings and the example governments will take in making buildings energy efficient. But renovation of commercial and residential buildings will

also be substantially influenced,” says Aho.

A desire for modern luxury in indoor climate also drives people to renovate. Bringing modern-day cooling systems to an existing building is a convenience that many homeowners want during the hot summer months. Radiant heating also offers considerably more comfort when walking inside compared to heating from on-wall radiators.

“For office buildings, lack of cooling can make a building commercially obsolete for its owner. Uponor ceiling cooling systems are an easy match for renovations where suspended ceilings are introduced. Our solutions are integrated into the building structure, so they help to preserve the architectural appearance of a building,” adds Aho.

“The materials we use are critical assets and have an impact on the quality of the renovation project. It is our job to make sure these products are manufactured at the highest standards,” says Ruohio. “We are open in dealings with our customers and responsible in our actions. Also, we offer the best technical skills and local resources to help. We stand by our products.” «

A desire for modern luxury in indoor climate drives people to renovate.



In 2011, it was estimated that 49% of all spending on residential construction in the U.S. went towards improvements. In Europe, 60% of residential construction went towards renovation.

49

60

MODERN LIVING

DURING 2006, the owners of the Suomen Puhallintehdas factory were considering an option to tear down their old building. **Johanna Mutanen**, an architect with the Helsinki City Planning Department, stepped in and offered a suggestion. "Why not convert the factory into a modern loft residence?"

The owners accepted the idea, and in 2008 the conversion was complete. Parts of the old factory were demolished, while the three-storey portion was saved. The factory, built in 1936, was used to manufacture different types of industrial fans. "Over the years, many people were employed at Suomen Puhallintehdas, so it served as an important part of the cultural and social fabric of what was once a little village," explains Mutanen.

"By converting the building into loft residences, we were able to preserve the history of the area, something the local residents really appreciated."

UPONOR PLAYED a part in helping to breathe new life into this factory by providing radiant heating to the 23 residential flats. "We have done other conversions and delivered this expertise to our client, international project development and construction group Skanska," says **Mika Tarvainen**, Key Account Manager at Uponor in Finland.

With Uponor radiant heating, homeowners enjoy modern comfort and potential savings on energy bills. "Anyone who has walked on a cold floor knows that the feeling is unpleasant," notes Tarvainen.

"Our solution lets users drop the room temperature by one to two degrees celsius and still maintain a much better level of comfort than one can get from traditional radiator heating. As long as the heating is not turned on excessively high by the user, the lower room temperature translates into an estimated 5 to 10 per cent savings in energy costs."

SAVING THIS old building is something Mutanen takes pride in. "We wanted to keep the factory image, which you can see in the lighting that was chosen for the staircase and in the tall ceiling height of the rooms. This is not an ordinary block of flats, and the building suits the area where it is located."

*Uponor employs
approximately 3,200 dedicated
professionals in 30 countries.*

UPONOR IS A LEADING international provider of plumbing and indoor climate systems for the residential and commercial building markets. In the Nordic countries, the company also supplies pipe systems for utility infrastructures. Uponor's solutions play an important role by providing products that help to create better human environments.





business

Human touch delivers innovation

PERSONALISED INTERACTION: THE DRIVER IN CREATING
BETTER LIVING ENVIRONMENTS THROUGH A UNIQUE UNDERSTANDING
OF WHAT THE CUSTOMER REALLY WANTS.

Uponor's business is not just about connecting pipe. It's about connecting people and building relationships that deliver long-term value. Moving beyond the role of a traditional supplier, Uponor has a history of working closely with its customers and partners.

"We share knowledge, which helps us to understand the needs and challenges of our customers. We show that we really care and want to develop new solutions that support their businesses," says **Marika Hållander**, Marketing Manager for Uponor's infrastructure solutions.

Building up customer knowledge takes place on many fronts, but there is one unique way in which Uponor strengthens the relationship with its customers.

"Our most valuable relationship-building tool is customer training," reveals Hållander.

UPONOR IS amongst the first in the industry to begin educating its customers in the art of installing its systems. Training takes place at the Uponor Academy, the company's own training institute. A variety of workshops and online courses are offered globally.

The Academy teaches professionals everything they need to know to design and install Uponor systems safely and properly. It also offers a unique platform for knowledge sharing.

"Contractors learn installation, distributors learn sales arguments, and engineers learn about legislation and recent innovations. They learn from our

experienced team and we learn from them – it's a two-way street," says Hållander.

IN ADDITION to offering hands-on installation workshops, the Fristad-based Uponor Academy in Sweden arranges off-campus courses on a wide range of construction-related topics. The workshops are so informative that participants truly get their money's worth.

"Of course we focus on our solutions and installation methods, but we also look at topics such as legislation, standards, life cycle analysis, and the overall benefits of plastics. We clarify legal details, explaining how to use our solutions in compliance with regulations," explains Hållander.

And when customers attend training, they come away with more than theory and tips of the trade. They become part of a growing Uponor family, with expert support always just a phone call away.

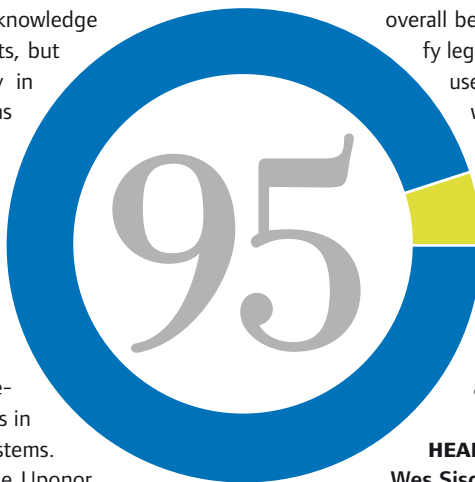
HEADED BY Training Manager **Wes Sisco**, the Uponor Academy in Apple Valley, Minnesota is a 1,000 square metre purpose-built learning facility complete with classrooms and hands-on applications labs.

Here Sisco and his co-instructor **Steve Swanson** offer courses to professionals in the plumbing, fire sprinkler, and radiant heating and cooling industries. Supplementing face-to-face workshops is a wide range of e-learning tools and webinars.

"I've been in this industry just about all my life. This gives me the ability to speak to my audience on

Uponor's Steve Swanson (black shirt) points out where to install a fire sprinkler system in the hands-on applications lab.

The Uponor Academy in Ochtrup, Germany has received excellent ratings, with 95 per cent of attendees saying they would recommend the training and 95 per cent affirming they were able to directly apply what they learned.





OPEN INNOVATION FOR PARTNERSHIPS

BY WORKING TOGETHER, partners can achieve a level of excellence that neither party could attain on its own. Uponor pools its expertise and resources with a number of leading developers to speed up product development and create added-value solutions that directly benefit the customer.

"Partnering is a time- and cost-effective way to conduct development work," affirms Esa Hirvonen, Vice President of Technology at Uponor.

A good example is Uponor's recent collaboration with Rautaruukki Corporation to develop solu-

tions for ground heat exchangers. By pooling Rautaruukki's know-how in pile foundations and Uponor's expertise in energy collection, the partners came up with an exciting new solution within a radically reduced time frame.

With environmental awareness emerging as a key driver in the construction industry, Rautaruukki began researching the use of piles as a source of energy. At the same time, Uponor developed its high-performance G12 heat exchanger, a new technology for ground source energy collection.

"We discovered we were interested in the same topic, so we initiated co-operation," says Hirvonen.

The new solution simultaneously functions as part of the foundation and as an energy source for heating and cooling, bringing substantial cost savings in the construction phase.

"This co-operation is mutually beneficial, helping to differentiate both our companies from the competition. It's also a win-win situation for our customers, who enjoy the benefits of a uniquely pooled solution," adds Hirvonen.

Across the Atlantic, too, the Uponor Academy is all about networking. Customer training is hugely popular in Germany, with over 10,000 participants attending more than 800 events last year.

a level playing field. I speak their language, I understand their problems, and I can provide them with a practical Uponor solution to fit their needs. The bond between Uponor and our customers grows stronger every time we interact," says Sisco.

Intensive but fun, the training builds close personal ties, verified by the feedback of the 1,753 professionals trained at Apple Valley in 2011.

"Wes is one of the most knowledgeable and passionate trainers I have ever been associated with. His ability to take complex subjects and make them easy to learn is remarkable. This has been one of the best training classes," says **Brandon English** of Ferguson Enterprises.

ACROSS THE ATLANTIC, too, the Uponor Academy is all about networking. Customer training is hugely popular in Germany, with over 10,000 participants attending more than 800 events last year.

The training ranges from half-day seminars to intensive workshops at various locations around the country. The German training hub is the 630 square metre Ochtrup facility, complete with modern seminar rooms and 17 kilometres of pipe for simulating real installation methods.

"We're currently building a 'Worklab', a showroom with facilities for hands-on exercises. We plan to combine classroom training with Worklab sessions," explains **Michael Heun**, head of the Ochtrup facility.

The Uponor Academy in Germany has received excellent ratings, with 95 per cent of attendees saying they would recommend the training and 95 per cent affirming they were able to apply directly what they learned. "The Academy keeps our

"We share knowledge, which gives us a deeper understanding of customer needs."

customers informed. It speeds up the introduction of new technologies and ensures faster installation and higher quality. It's a great way of bonding with customers," says Heun.

The German-speaking region has had its own knowledge-sharing tradition since 1979. Attended by over 6,000 participants to date, the annual Uponor Arlberg Congress held in Tyrol, Austria is a progressive forum for exchanging expertise related to construction technology and new standards.

"It goes far beyond other congress formats in the industry, as it has proven its capability to set future trends. The topics change each year, mainly focusing on hygiene, green building, and renewable energies," says **Georg Goldbach**, Uponor Area Manager for Germany, Austria, and Switzerland.

The value of the congress is not only the transfer of knowledge, but also in building relationships. "Customers who have attended the congress show a very deep loyalty to Uponor. They become part of a strong trend-setting community," says Goldbach.

A NEWER TRADITION is the Uponor Knowledge Days event, an executive-level seminar held for the third time in Hamburg, Germany last year. Launched in 2008, it consists of three days of intensive lectures and discussions with industry opinion leaders on themes such as sustainability and energy efficiency.

"We received new ideas and had great fun. Thanks to the Uponor team for organising the event," praises **Vera Burtseva**, CEO of the St. Petersburg-based Bureau of Technics. Burtseva was one of 68 guests from over 15 countries attending last year's event. «

"This new machinery will bring down costs, improve worker safety, and provide a platform for future development," says Apple Valley, Minnesota Plant Manager Rusty Collier.

SOMETHING NEW UNDER THE SUN

ONE OF THE pioneering ways in which Uponor promotes innovation is by working together with students and academic institutions. The Solar Decathlon is a competition organised by the United States Department of Energy challenging collegiate teams to design energy-efficient houses powered exclusively by the sun. Working with technology suppliers, teams spend almost two years creating houses that combine design

excellence with optimal energy efficiency. First prize in the 2011 Solar Decathlon went to the University of Maryland's WaterShed house which features an Uponor PEX plumbing system. Uponor plumbing and fire suppression systems are also featured in two other prize-winning Decathlon homes.

UPONOR WAS ALSO closely involved in Europe's first Solar Decathlon compe-

tition held in Spain in 2010. University decathletes from 17 teams competed in ten categories to construct the house with the lowest energy consumption. First prize in the categories of industrialisation and market feasibility went to the house utilising Uponor indoor climate solutions, winning the most votes from the 190,000 visitors. The next European Solar Decathlon will take place during summer 2012.

LISTENING AND LEARNING

MANY RECENT Uponor innovations to come out of Minnesota are a direct response to customer feedback. The Apple Valley team sits down regularly with focus groups – professional plumbing and heating contractors – who keep them informed on new emerging trends in the market.

“They tell us what is needed, what is working, and what needs improvement,” explains Apple Valley’s Plant Manager Rusty Callier.

THE NEW Punch&Pull™ plastic packaging concept is a tangible example of how Uponor responds to feedback proactively. With this cardboard-free coil solution, the installer simply punches the centre, pulls out the desired length of pipe, and then tucks the end back into the coil before transporting it to the next job.

“Customers didn’t like the way cardboard boxes crushed after being moved time and time again. With its built-in pipe storage and enhanced portability,

Punch&Pull minimises waste and provides ease of operation.”

Punch&Pull is just one of many innovations to emerge from customer collaboration. “We’ve developed PEX Rings with Stops, Coloured Pipe, pre-insulated pipe, PEX expansion loops, and Pipe-in-Pipe, to name just a few,” lists Callier.

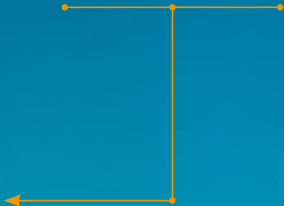
“Our customers feel confident that we not only listen, but also act in a diligent manner to provide them with the solutions they want and need.”

CHRIS BOHNHOFF





Uponor believes in sustainable building to preserve and maintain future resources.



Uponor builds upon a sustainable strategy

UPONOR IS COMMITTED TO PARTNERING WITH PROFESSIONALS
TO CREATE BETTER HUMAN ENVIRONMENTS.

The company operates throughout Europe and North America, aiming to gain a stronger foothold in the rapidly developing markets of Eastern Europe, the Middle East, and Asia. Whether it is heating and cooling, or water and wastewater services, Uponor benefits from a strong tailwind of sustainability that is changing the landscape of building worldwide. Nevertheless, economic cycles have a major impact on the development of Uponor's core businesses.

Uponor's strategy rests on three pillars: growth, operational excellence, and the Uponor brand. One of the key initiatives in terms of growth is to enter the project business. It is a different business segment from Uponor's traditional single-family segment where business is done mainly through distributors and installers. In the project business, the company works in close collaboration with developers, planners, contractors, and construction companies from the very initial stages – often tailoring the process to meet specific requirements. In 2011, the company secured a majority holding in Zent-Frenger, a German market leader that specialises in heating, cooling, and geothermal energy solutions within the commercial and public building sector. Uponor gained access to new technology, project and supply chain expertise, alongside a range of product offerings, for example, for renovation and refurbishment. With this acquisition, Uponor strengthened its position in the project business, especially in the German market.

The strategic fit with an earlier acquisition of Velta UK was also clear. Velta's presence in the

project business strengthened Uponor's position in the indoor climate business, offering an opportunity to increase the market penetration of plumbing systems in the commercial sector. The partnership complements Uponor's existing dis-

**Low-energy building
is a macro trend
that favours
Uponor's offering.**

tribution business and provides sales opportunities, new technical skill sets, and project customer relationships and know how. The company is on its way to materialising fully the benefits in international markets.

In order to strengthen its total offering, Uponor is involved in a number of partnerships that introduce innovative products to the market. These products are attractive to builders as they help to increase efficiency in the construction process. One example is co-operation with concrete companies to offer heated floors installed as one package.

UPONOR IMPLEMENTED a unified Uponor brand in all its marketing at the beginning of 2006. In an ever-internationalising marketplace, the company wanted to generate more return on its branding investments. The coherent brand strategy paved the way for enhanced operational excellence through common processes and a common ERP system. The five-year ERP development programme made it possible for all European operations to share unified processes and a transparent planning system. It cov-

ered the entire supply chain with the focus shifting gradually from production to warehousing to logistics and distribution functions.

THROUGH A CENTRALISED supply chain, Uponor has achieved significant performance improvements in recent years – improving customer service levels and supplier delivery performance while reducing inventory levels. In the current market situation, an integrated supply chain has been central to improving efficiency and financial performance.

Efficiencies have also been sought through the harmonisation of Uponor's offering, mainly a European plumbing and indoor climate offering, as well as executing a pan-European segmentation model to harmonise key messages and value propositions to specific customer groups.

To support its growth strategy, Uponor is focused on innovation in its product and service offering with unique solutions already launched or in the pipeline. These new products have attracted wide customer interest and strengthened Uponor's position in its key markets.

UPONOR IS A GLOBAL leader in radiant heating and cooling systems and in plumbing systems, utilising PEX-a and composite pipe technology, and with a strong market share in infrastructure solutions in northern Europe. It is estimated that the demand for radiant cooling, in particular, is growing in building construction along with increasing demands set for air quality in both residential and non-residential indoor environments. The low-energy building concept and the need for increased efficiency in the building industry is a macro trend that favours the Uponor brand. «

Keeping promises

UPONOR PRESIDENT AND CHIEF EXECUTIVE OFFICER
JYRI LUOMAKOSKI BELIEVES THAT SUSTAINABILITY WILL CHANGE
THE FACE OF BUSINESS AS WE KNOW IT — FOR GOOD.

Discussions about the risks and opportunities associated with climate change have piqued the curiosity of investors as to its effect on business today. Perhaps nowhere is this more evident than in the field of construction. Luomakoski feels that the fight for improved sustainability has barely begun.

"If mitigating climate change was a 10,000 metre running competition, we would have cleared only a lap or two. The race is just starting," he comments.

Uponor has been developing green solutions for both heating and cooling purposes – and customers around the world have responded well to these products. However, with economic uncertainty in the air, how real is the threat that environmental issues get pushed to the background, if people focus on the bottom line only? Luomakoski responds by saying that there is a broad consensus in the industry to stay the course: sustainable construction is the way of the future, and economic fluctuations will do little to alter this fact.

"The cost of building sustainably is the same or only slightly higher than that of traditional building," he says, adding that some sustainable components have higher first costs but provide financial rewards further down the road.

STILL, FROM THE POINT of view of Uponor, the green mindset must always be linked with products that are easy and pleasant to use. Luomakoski talks about providing opportunities for builders:

"We have ample offering within our chosen segment, so one could say that compatibility has been taken to a very high level – which is quite helpful from the perspective of the professionals in the field."

Behind innovative solutions and products is an ambitious R&D. Luomakoski points out that in this arena, long-time focus on improving products and services is the key to sustained success.

Everything starts and ends with recognising the customer's needs.

According to the CEO, customer orientation plays a major role. "Everything starts and ends with recognising the customer's needs."

When discussing what separates Uponor from its competitors, Luomakoski refers to brand studies which cite "reliability" and "staying committed" as key characteristics of the company.

"We stand by our products and promises," he says. "This approach is easy enough when things are going well, but the true test of a company is at hand if there is a sudden problem."

RECENTLY, UPONOR has seen growth in the United States, Germany, and Sweden. The common denominator amongst the three is that Uponor has a large organisation in all these countries and holds a significant market share.

"We also have production in these countries which is a big help," Luomakoski says. The American market is interesting in the sense that the volume of new construction plunged 70 per cent in a period of just a couple of years – but Uponor did not downsize its own presence to reflect the altered reality. "We stayed committed and stayed put."

The recent successes in Sweden and Germany are different cases, since no big recession materialised there. The common factor for these markets is quality-orientation and a penchant for environmentally-friendly solutions.

"Germans and Swedes enjoy products which can be quickly installed, since the cost of labour is considerable in these countries."

The green mindset must always be linked with products that are easy and pleasant to use.

Uponor President and Chief Executive Officer Jyri Luomakoski cites reliability and staying committed as key characteristics of Uponor.



Local markets in Asia are interested in cooling systems, which Uponor views to be a strong driver for growth.

One very interesting case is Spain which during the past few years witnessed a dramatic 90 per cent drop in new construction. Nevertheless, energy-efficiency is very much on the rise in that country. Staying positioned in Iberia is proving to be a winning strategy: "Some of our competitors have exited the market and our attractiveness as a partner has increased in the eyes of the constructors and installation crews," analyses Luomakoski.

Plastic pipe is one of the big success stories in construction.

EASTERN EUROPE remains

a challenging market. Sustainability is not a major factor and the price of energy, on the other hand, is on a moderate level.

A great potential for Uponor remains in Asia. Driven by such giants as China and India, Asian markets offer plenty of opportunities in the construction sector. Luomakoski admits that Uponor is not yet a significant player in the region: "We are analysing the best way to enter."

Asia is appealing in the sense that the local markets are interested in cooling systems which Uponor views to be a strong driver for growth. The Eastern trend mirrors that of the West: cooling is, in fact, already more important in many parts of Europe and North America than heating.

While on the topic of growth drivers, Luomakoski notes that the project business shows promise, and in effect, expands the reach of customer segments.

BALANCING BETWEEN organic growth and acquisition-based growth is something that Uponor has experience in. The latest acquisitions include Velta UK and Zent-Frenger in Germany.

"We make acquisitions to get competences and technology, not so much to gain market share," he explains.

On the materials side, plastic pipe has been one of the big success stories in construction. "The penetration of plastic materials is supported by the environ-

mental viewpoint: a comparative life cycle analysis of a typical copper installation showed the plastic solution on average having 27 per cent of the impact of the copper pipe system," Luomakoski says, remarking that plastic pipe is also quicker to install and has a longer service life.

LUOMAKOSKI HAS been with Uponor since 1996, and observes that while, geographically speaking, the Uponor people are rather spread out, there is still a strong sense of working together. "We have the right teams in place and they are fully capable of running the local operations," Luomakoski says, pointing out that common rules are important in this equation, as is a certain sense of empowerment.

"It's important for the flexibility of our operations that our people can think and act on their own." «

Uponor's competitive strength is based on its widespread geographic presence.

COMPANY OWNERSHIP

UPONOR HAS approximately 20,000 shareholders. The ten biggest shareholders – most of them institutional investors – own 66 per cent of the shares. Oras Invest is the major shareholder, owning 22.6 per cent of the company.

"The ownership of Oras Invest has been significant since autumn 1999," says Jyri Luomakoski, CEO of Uponor. Oras Invest adds a degree of stability in the ownership structure, having been the key owner for well over a decade.

AT PRESENT, 24.5 per cent of the shares are owned by foreign shareholders, the largest being the Capital Group, through its equity income fund, which became a significant owner in 2001.

ACCORDING TO Luomakoski, Uponor has many owners who are investing for the long-term. The company is also known for a competitive dividend pay-out.

When asked about who drives the company, the owners or the customers, Luomakoski replies by saying that both these stakeholder groups are considered in everything the company does.

"In the final analysis, it's about the choices, we as a company, have to make. We make these decisions to be better able to respond to the needs of the customers," he analyses.

"Different choices come with different risk profiles. Selecting the proper alternative depends on the preferences of the owners."

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