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INSULATION MATTERS

KNAUFINSULATION
it's time to save energy

Big deal: major expansion in North America

War on waste: cutting landfill waste by 50%

Urbanscape: greening the world's rooftops

Lives transformed: the power of renovation





Cold in your home?

Your house is poorly insulated.

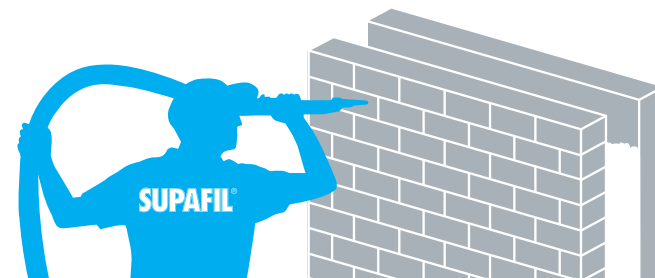
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- For walls and ceilings.
- Fast and clean installation.
- Ecological and fire resistant.
- Up to 50% energy savings*.
- Economical.

* Studies done by Knauf Insulation using calculations recognized by the Spanish Ministry of Industry, Energy and Tourism.

www.knaufinsulation.com/en/Supafil



IT'S TIME TO SAVE ENERGY

WE STAND at the cross roads of a major change to our energy system. Today we are living with the legacy of a carbon based energy system and with buildings that were built with little thought to their energy efficiency. This legacy is on one hand putting at risk our very existence through climate change and on the other pitting countries against each other around access to carbon based fuels.

Set against this backdrop is the simple fact that over the next 30 years, the world will need to spend €9 trillion a year on our energy system, whether it be building new power plants to increase supply or renovating buildings to decrease demand.

How we choose to spend this money will either help in the fight against climate change and reduce our dependence on carbon-based fuels or simply keep us on the current unsustainable path.

How we choose to spend this money will either lead to the creation of millions of much needed jobs in the construction sector and boost our local economies or simply go towards paying ever higher and higher energy bills.

At Knauf Insulation we are clear which way forward makes sense. We believe that it is critical that we use the next years to reduce our dependence on energy and in doing so help drive economic growth. We believe that the place to start is by renovating our existing building stock and by ensuring all new buildings



are built to near zero energy standards. And in 2015 you will see us making this case even more strongly than before.

We need to become even more vocal on the need to save energy because the evidence of the consequences of doing nothing are becoming starker by the day; and in this year's sustainability report you can read about some of these issues.

You can read about where the world's leading scientists believe we are heading in terms of climate change if we don't change our course as well as the dramatic consequences that they are predicting global warming will cause. Beyond climate, we have also seen this last year more and more conflict around energy and access to energy and the issues behind this are also covered in this year's report.

At the same time, you can also read about the efforts that we are making as a company to walk the talk and reduce our own energy use

and climate change emissions, as well as the significant efforts that our public affairs teams and our many partners are making to get the message out that the best energy is saved energy.

In 2015 we will need to continue to up our game. Not everyone supports our message about saving energy and therefore we need to talk more and talk louder. We need to also continue to walk the talk as a company and continue the excellent efforts we are making to make our products even more energy efficient than they already are. It was and it very much remains time to save energy.

Tony Robson, CEO of Knauf Insulation

ABOUT THIS REPORT:

This Sustainability Report relates to Knauf Insulation, part of the Knauf Group. This Report sets refers to data from 2013 and activities from 2013 and 2014. The content and quality of the information are guided by the Global Reporting Initiative's (GRI) G3 sustainability reporting guidelines. The contents of the Report are complemented by information available online and from other local Knauf Insulation company websites. The data provided are as comprehensive as possible considering recent acquisitions and we intend to provide data on our entire operations in future reports. In 2013 the boundary of the reporting entity, Knauf Insulation, covered 27 manufacturing sites across Europe, CIS and North America.

YOUR VOICE!

Let us know your comments or email us your questions at sustainability@knaufinsulation.com

Follow us on Twitter at Klcorporate



Read more at <http://www.knaufinsulation.com/en/sustainability>

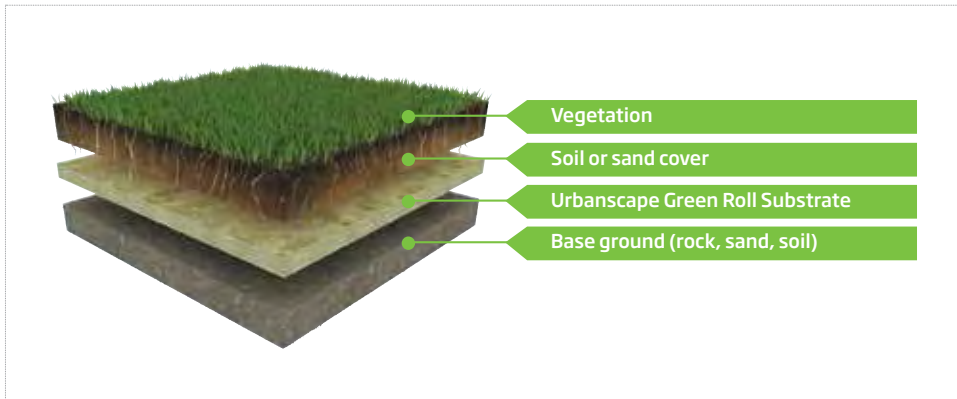


Urbanscape

An innovative Landscape Solution

Benefits

-  High water conservation
-  Reduced irrigation frequency
-  Reduced fertilizer consumption
-  Improved root growth
-  Stronger plants
-  Efficient installation
-  Sustainability



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Above and beyond



- 01 WELCOME:** Tony Robson, CEO of Knauf Insulation, on why it's time to save energy
- 04 NEWS IN BRIEF:** National awards, global expansion, and pioneering sustainability breakthroughs
- 06 BIG DEAL:** Acquiring Guardian Insulation positions us as one of the biggest in the industry
- 08 IT'S TIME TO GET ANGRY, AGAIN:** Leading climate change professor discusses the importance of action.
- 10 THE MISERY OF DEPENDENCE:** Why Europe's addiction to foreign energy has to end
- 14 WORLD IN ACTION:** Our global campaigns ensure energy efficiency tops national agendas
- 22 WALKING THE TALK:** How we are reducing our energy use throughout Knauf Insulation
- 26 JUMPING FOR JOY:** How our renovation halved one family's energy bill
- 30 MAKING IT EASY:** Our EASY® insulation makes energy efficiency easier for everyone
- 32 DAWN OF A NEW ERA:** How we measure up against one of the world's first mandatory green code
- 36 ABOVE AND BEYOND:** Our green roof solution Urbanscape® is growing in popularity, here's why

COVER STORY

How renovation makes lives better. The transformational stories behind an installation of SUPAFIL® at this Belgium home, see page 16

- 40 OUR EPD FAST TRACK:** The success of our fast-track Environmental Product Declaration service
- 44 CHAIN OF RESPONSIBILITY:** Our contribution to the circular economy and our supply chain improvements
- 46 WAR ON WASTE:** We've cut our waste to landfill by 50% in four years
- 50 FIRE SAFETY'S FATAL FLAWS:** We're campaigning to improve fire safety in buildings
- 56 KNOWLEDGE IS POWER:** The scientific research proving how much energy is saved through renovation
- 58 BEYOND BUILDING SOLUTIONS:** From green deserts to better ovens, we're making a difference
- 62 CULTURAL (R)EVOLUTION:** The behavioural changes creating a safer workplace for everyone
- 66 TALENT FOR THE FUTURE:** Achieving business challenges and nurturing a sustainable workforce
- 68 LIFE LESSONS:** Why so many people stay so long at Knauf Insulation, by those who know
- 72 COMMUNITY NEWS:** How we're supporting the communities where we work
- 74 SUSTAINABILITY IN FIGURES:** Our performance and governance structure at a glance

Company NEWS



First 'Eco-platform EPDs'

KNAUF INSULATION is celebrating a milestone in product sustainability after being awarded the first of the new type EPDs (Environmental Product Declaration); ECO Platform EPDs by IBU, Institut Bauen und Umwelt. ECO Platform was set up to support the provision of type III Environmental Product Declaration across Europe through the harmonisation of a core content and format based on the standard EN 15804.

It is a breakthrough for the construction industry as it paves the way towards a single system of product sustainability that can be recognised across Europe rather than each country promoting its own EPD.

The first three ECO Platform EPDs to be awarded to a company were presented to Knauf Insulation for its Glass Mineral Wool 032, 035 and 042 unfaced rolls with ECOSE® Technology.

"Knauf Insulation has been pioneering faster, more effective ways of delivering environmental information to our customers for many years. The fact that we are today ready with three ECO Platform EPDs, covering a large number of products available across Europe is a tribute to that hard work," said Vincent Briard, Head of Sustainability, Products & Buildings.

All our EPDs, including ECO Platform EPDs, are available at www.knaufinsulation.com/en/product-sustainability



New plant opens in Turkey

KNAUF INSULATION has opened its first plant in Turkey. Based in the province of Eskişehir, the site employs 130 people and has an annual Mineral Wool capacity of 45,000 tonnes. "The plant opens up exciting business opportunities not just in Turkey but also in neighbouring countries," says Emre Gürcan, the company's General Manager in Turkey.



Key industry role for John Sinfield

JOHN SINFIELD, Managing Director of Knauf Insulation, Northern Europe, has been appointed as the new chairman of the UK Construction Products Association (CPA).

The CPA is the voice of construction product manufacturers and distributors in the UK.

Sinfield said: "Given all the political uncertainty over the coming year with regulatory doubt over energy security, costs and carbon measures, we need manufacturing to be underpinned by a vibrant, long-term, cross-party industrial strategy which enables the UK to capture supply chain advantages for firms in this country."



FIVE YEARS OF ECOSE TECHNOLOGY

This year, Knauf Insulation celebrated five years since the development and introduction of its binder technology, ECOSE Technology. With no added Formaldehyde, this binder was the first to be awarded the Eurofins Indoor Air Comfort Gold standard in 2010 for its enhanced environmental performance versus the previous Formaldehyde-based binder. Since 2010 our Glass Mineral Wool products with ECOSE Technology were awarded the Blue Angel in Germany, the longest standing environmental protection designation in the world.

Major expansion sealed by deal

KNAUF INSULATION has acquired Guardian Insulation in North America in a major deal that firmly establishes its leadership position in the world's largest insulation market. More than 600 new employees joined the Knauf Insulation family following the acquisition that includes six Guardian Glass Mineral Wool manufacturing plants and 14 Guardian Laminated facilities.

"We are delighted to acquire such a high quality business that fits perfectly with our growth strategy," said Mark Andrews CEO of Knauf Insulation, North America. "I believe we will transform our two companies into the best organisation in the insulation industry." See full story page 6.



Recognition for health benefits in France

KNAUF INSULATION'S 'EXPERT' range is the first and currently only Glass Mineral Wool product to have been recognised by the French Association of Health Professionals, ASEF (Association Santé Environnement France) – in collaboration with Leroy Merlin – as 'Validated by Doctors'. This follows the increasing demand of customers wanting products with lower levels of substances like Volatile Organic Compounds and Formaldehyde.



BUSINESS BOOST IN KAZAKHSTAN

Knauf Insulation has expanded its presence in Central Asia with the creation of Knauf Insulation Kazakhstan LLP in Almaty.

Supported by the company's Glass Mineral Wool plant in Tyumen in Russia, Knauf Insulation Kazakhstan and its team of 10 serves markets in Kyrgyzstan, Uzbekistan, Tadjikistan, Turkmenistan, Mongolia and Afghanistan.

Gold standard

KNAUF INSULATION France has won two gold awards and one bronze for building innovation from the French National Association of House Builders. One gold came from BOOA Frame Construction for the Urban Answers category for Knauf Insulation Fit 032 in roofs and walls and the other came for SUPAFIL® Loft 045 from CMO in the Special Jury Prize category. SUPAFIL was awarded bronze by DELRIEU Construction in the 'Technology and Performances' category.



40 YEARS AT SURDULICA

In Serbia, our Surdulica plant celebrated its 40th anniversary in 2014.

Surdulica began production of Rock Mineral Wool in May 1974 and employed 40 people. The plant now employs 130 and exports its Rock Mineral Wool all over Europe.

This year, the plant was awarded second place in a competition organised by the Serbian Ministry of Work, Employment and Social Policy to mark World Day for Safety and Health at Work.

EPDS AVAILABLE QUICKER THAN EVER

Knauf Insulation is providing product sustainability information in a range of formats designed to meet the requirements of all customers. Not only that, but we are providing it quicker than ever, with some formats being available instantaneously, and others available at 15% of the time it used to take. From an Environmental Product Declaration (EPD), which covers every element of a product's life in minute detail to an Environmental Fact Sheet (EFS) Knauf Insulation can deliver.



North America's BIG DEAL

Knauf Insulation's acquisition of Guardian Insulation in the US positions the company as one of the biggest in the industry.



The acquisition of Guardian Insulation included Glass Mineral Wool plants in Albion (above) and Inwood (right), dramatically expanding Knauf Insulation's manufacturing footprint

"THIS IS an important step in our mission to become the global leader in energy efficient systems for buildings," said Mark Andrews, CEO of Knauf Insulation in North America, describing the acquisition of Guardian Insulation in 2014 by Knauf Insulation.

Included in the transaction are Guardian Fibreglass, a leading supplier of insulation for the construction market, and Guardian Laminated Building Products.

"We are already one of the fastest-growing insulation companies globally and this deal firmly establishes our leadership position in what is the largest insulation market in the world," said Andrews.

"We are delighted to acquire such a high quality business that fits perfectly with our growth strategy. I believe we will transform our two companies into, quite frankly, the best organisation in the insulation industry."

More than 600 new employees joined the Knauf Insulation family following the acquisition.

Joey Viselli, Vice President of Integration in North America, said: "Every single person in all our locations plays a key role in advancing our mission to become the world leader in energy efficiency systems," he said. "We have been strong individually, together we are unbeatable."

The acquisition is also great news for customers of Knauf Insulation and Guardian due to the highly complementary nature of the businesses.

"This combined entity will have a dramatically expanded manufacturing footprint to help provide high levels of service," said Viselli. "Knauf Insulation is also recognised as having the most advanced manufacturing techniques in the industry and customers will benefit significantly from the resulting high quality energy efficient products we produce."

A key benefit for customers, Andrews said, was having more than double the production capacity of Glass Mineral Wool at the company's disposal, enabling Knauf Insulation to position



A NATURAL FIT

Guardian Insulation and Knauf Insulation have a lot in common.

Both are privately owned, both parent companies were founded in 1932 and both started selling insulation in North America in 1978.

itself as a leading manufacturer in North America that "is more than capable of meeting the needs of a growing market".

Knauf Insulation now has manufacturing plants across six US states as well as 14 facilities across North America. Addressing employees of both companies, Andrews described Guardian Insulation as an outstanding fit for Knauf Insulation.

"Now the deal is done, we have a unique opportunity to combine great talent from two complementary organisations," he said. "As one we have the ability and ambition to further position Knauf Insulation as both a leading manufacturer and formidable competitor in the market place." ■

It's time to get angry ~ AGAIN

Climate change is creating more famines, more poverty and more inequality. It could push humanity to the brink of war over food and water. Governments need to cut emissions. Now.



GETTY IMAGES

CLIMATE CHANGE IS LEADING TO DESTRUCTIVE HEAT WAVES, terrifying flooding and causing environmental devastation across the planet. Now the bad news. The United Nation's Intergovernmental Panel on Climate Change (IPCC) has for the first time described climate change as a serious threat to human security. That means more famines, more poverty, inequality and even potential wars over food and water. In the words of Ban Ki-moon, the United Nations Secretary General, "The heat is on. We must act." In an interview with *Insulation Matters*, professor Jean-Pascal van Ypersele, vice-chair of the IPCC explains why. "Nobody on this planet is going to be untouched by the impact of climate change."

Are humans responsible for climate change?

It is extremely likely – a probability of 95% – that most of the warming since the middle of the 20th century is due to the effect of human activities through greenhouse gases including CO₂. This conclusion is scientifically solid. If a physician tells you that you have a 95% probability of getting a cancer you do something.

And we are feeling the impact of warming now?

It is becoming clearer that the consequences of that global warming and the changes in other parameters such as precipitation, intensity of rain, heat waves, decreasing frequency of cold events and increasing sea levels are starting to have visible consequences on eco-systems and people's lives.

In what way?

In 2014 we have seen exceptional flooding in New York, Montpellier and Kashmir with people losing their lives. Warming is having a severe impact on health. For example, the 2003 heat wave in Europe killed more than 50,000 people in two weeks. We know

that such a heat wave had a probability of happening that was close to zero without climate change.

Could warming lead to civil wars and conflicts?

Climate change is a threat multiplier that aggravates situations. In areas where resources such as water are scarce a long period of drought will inevitably increase the level of tension and where you have tension you have sparks, conflicts and possibly wars.

What does the future hold?

There is no single answer. The IPCC and scientists don't talk about predictions. They are projecting what could happen under a range of different pollution scenarios: the temperature increases between 0.3°C and 4.8°C by the end of the century. We are almost a degree above pre-industrial temperatures already and the world's leaders agreed in 2009 that 2°C above pre-industrial levels would be dangerous for humanity.

Can you give examples?

They are numerous and can be read about in IPCC reports (www.ipcc.ch). But for instance, there are 10 million people living less than a

metre above sea level on the Nile Delta. An increase of 30-70cm by the end of the century could mean the displacement of millions.

Can we stay under 2°C?

As most of the warming is from humans that's good news because it's something we can change. If it were as a result of volcanic activity or alien intervention we would not be so empowered. The IPCC has concluded that it is possible to stay under 2°C and even under 1.5°C because we have all the technologies available, policies and the behaviour to organise things in other ways.

So why isn't it happening?

Ten years ago 75% of our energy came from fossil fuels now it's 80%. Emissions have increased by 2.3% a year in the past decade compared to 1.2% in the preceding 30 years. There is a mismatch between what is happening and what we need to achieve. Change is always difficult for people.

And the situation is becoming dangerous.

I often use the analogy of a bed. We keep putting blankets on the Earth but we are not aware of the additional heat straightaway. At home if we become too hot we can get up take off blankets and open a window. We can't do that with the Earth, we can't escape, the only way to stop is to stop adding blankets and make the ones we've added thinner.

Energy efficiency plays an important role in reducing warming?

Energy efficiency is a key aspect. By reducing energy use you reduce emissions and reduce the need for energy resources. It also connects the future to the present. People save money on their bill today and contribute to cutting emissions in the future.

What do you say to those who still refuse to acknowledge climate change?

There is no question mark over climate change. That's why the United Nations created the IPCC 25 years ago to sort out the different kinds of scientific information on which decision makers can base their decisions.

How reliable is this research?

The IPCC has over 800 peer-reviewed authors and scientists from more than 70 countries to do that. The science is very solid and open to revision. The fifth report is 4,000 pages of carefully worded assessment and close to 150,000 independent comments from external experts have been individually considered by the authors and put online. No other scientific document in the history of science has been subjected to such rigorous process. It's really the best state of knowledge.

www.ipcc.ch



GETTY IMAGES

Global warming is starting to have visible consequences such as exceptional rainfall, for example, the floods that waterlogged parts of the UK (pictured above) and the deadly deluges that swept through Kashmir devastating vulnerable communities (pictured left)

EUROPE'S ENERGY ADDICTION MISERY

Europe has access to incredible gas reserves in the form of wasted energy in buildings. Unlocking its potential will transform lives for generations and put an end to the suffering caused by over-dependence on energy.

OUR BIGGEST ENERGY reserve is not locked away beneath the frozen tundra of Russia's vast landscapes or fought over under the blazing heat of Middle Eastern skies.

It's hiding in plain sight, within our buildings.

Every year Europeans squander a staggering €500 billion on wasted energy.

And it all starts with the click of a switch. Every time we turn on heating or air-conditioning we instantly pump hard-earned money straight out of our homes into the pockets of energy suppliers abroad. Buildings are responsible for 40% of lost energy in Europe.

"If we saved this energy rather than waste it, we would unlock the biggest goldmine of opportunity in the world," says Tony Robson CEO of Knauf Insulation.

"Imagine what we could do with that money, the jobs that could be created, the possibilities for improving society, the lives we could change for the better with €500 billion every year."

And that's just for starters. Here's what else could be achieved.

WE COULD END OUR GAS ADDICTION

Europe's addiction to gas is becoming increasingly unhealthy, particularly in the light of recent events in the Ukraine.

A total of 21 out of the EU's 28 Member States are dependent on gas imports so it's no wonder that energy security has dominated the EU's political agenda.

But how's this for a solution, by saving energy, you don't need to buy any more from abroad.

For example, European buildings consume the same amount of gas as Europe imports from Russia. According to figures by Eurostat, Europe annually imports 1,139 terawatt-hours of gas from Russia while European buildings consume 1,258 terawatt-hours of gas every year.

Research by the Buildings Performance Institute Europe (BPIE) found that an ambitious EU-wide building renovation programme could, by 2030, reduce gas imports in Europe to 80% of the quantities imported from Russia to the EU in 2011.

THE VULNERABLE COULD BE PROTECTED

The European countries that are the most dependent on foreign gas are also the most energy inefficient, according to the environmental non-profit organisation E3G.

Countries such as Lithuania, Bulgaria, Slovenia and the Czech Republic import 100% of their gas. Unfortunately, compared to the rest of Europe, they are also far behind in implementing their commitments under the EU's Energy Efficiency Directive and have higher percentages of energy inefficient housing.

"Reducing European gas use through efficiency is the best route to strengthening European economies," says E3G.

€1.15 BILLION COULD BE SAVED EVERY DAY

In 1995 the EU was 43.2% dependent on energy imports but by 2011 this figure had grown to 53.8%, Eurostat research reveals. Using this information, the European Alliance of Companies for Energy Efficiency in Buildings (EUROACE) has identified a date each year when the EU runs out of energy and becomes 100% reliant on imports.

In 1995 'European Energy Dependence Day' fell on July 26, leaving the EU having to import energy for five months. By 2011, the date was June 18, adding 38 extra days to that five-month period of dependence.

If energy efficiency savings of 40% were introduced by 2030 across Europe, EUROACE says European Energy Dependence Day would be on October 26 – four months and eight days later than 2011.

"In addition, the annual cost of these imports is also rising at a worrying rate with Eurostat reporting that the EU spent €421 billion on these imports in 2012," says EUROACE. "That means for every day we can extend our energy independence by reducing energy demand a net saving of €1.15 billion accrues to the EU."

NEW JOBS COULD BE CREATED

The Renovate Europe Campaign recently commissioned research into the employment benefits of an EU-wide programme to make buildings more energy efficient with a binding target of 40%.

The campaign found that two million new direct local jobs could be created by 2020 rising to six million if indirect job creation was included.

Europe's public finances would enjoy €39 billion net in extra income by 2020 (rising to €78 billion every year by 2030) and there would be 0.7% per year growth in GDP, said the campaign.



Gas prices have increased by **40%** in the past 10 years

COMPETITIVENESS COULD BE SHARPENED

One of the fastest ways to become more competitive is by cutting costs. And costs don't come bigger than energy.

Average electricity and gas prices have increased by more than 30% and 40% respectively in the past 10 years, says Eurostat; meaning that European industry continues to pay vastly more than its global competitors for energy.

Energy efficiency sharpens industry's competitive edge.

A 2014 report by the European Industrial Insulation Foundation (EIIIF) into wasted industrial energy in seven European countries found that in Germany, for example, an initial country-wide investment of €180 million would pay back in less than 12 months saving the nation's industry €750 million every year. ■

FREAKONOMICS OF OIL PRICES



Fuel prices don't follow the normal laws of economics. In fact they often seem to make it up as they go along. For instance, the International Energy Agency (IEA) says production by the Organisation of the Petroleum Exporting Countries (OPEC) increased by less than five per cent from 2007 to 2013.

However, during the same period, OPEC's oil export revenue increased by 50% to a jaw-dropping US\$1.2 trillion. How can that be?

Easy. There is a lot of demand, but not enough supply.

"We have absolutely no control over energy prices, but we can control energy efficiency," says Barry Lynham, Group Director of Strategy and Communication at Knauf Insulation. The results speak for themselves. The IEA estimates that for a group of 11 member countries, investment in energy efficiency from 2005 to 2010 resulted in savings of US\$420 billion worth of oil.



11% of Europeans can't afford to heat their homes

THE COST OF A COLD HOME

There are many millions of people who can't afford to switch on their heating because their energy bills are too high.

"A total of 11% of Europeans, 55 million people, cannot afford to heat their homes, while in the EU average gas and electricity prices rose 5% in 2013," says the environmental non-profit organisation E3G.

The human cost is considerable. In the UK, the Marmot Review found that the National Health Service spends €990 million every year on fuel-poverty-related illnesses.

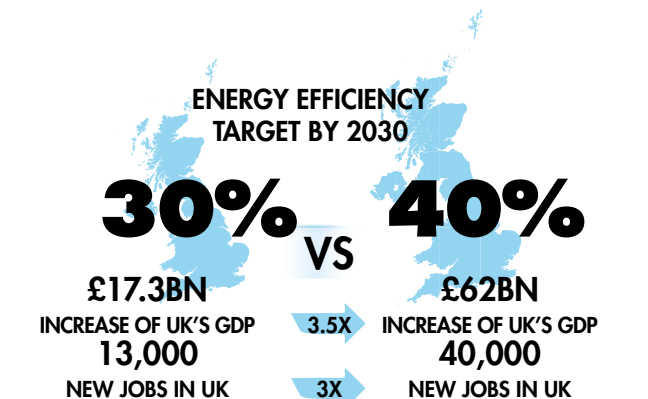
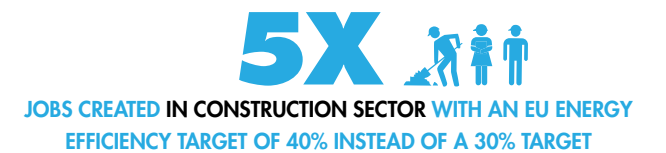
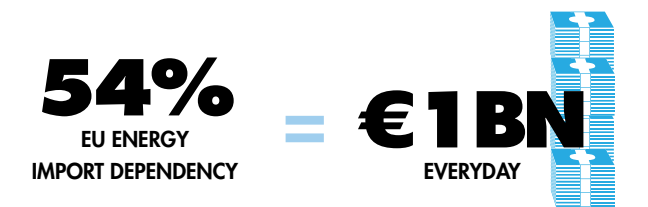
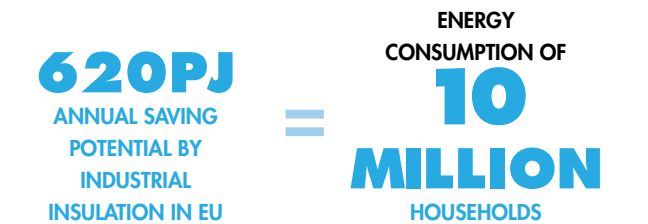
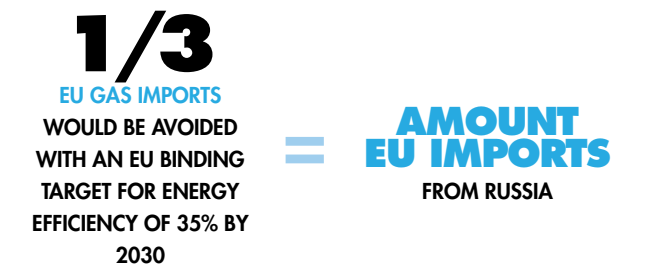
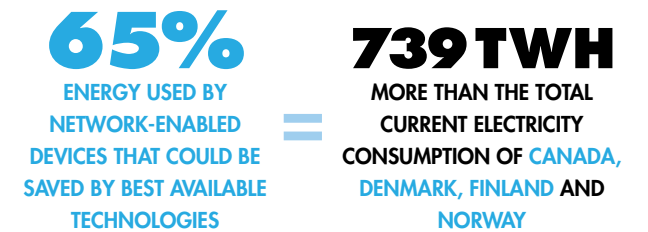
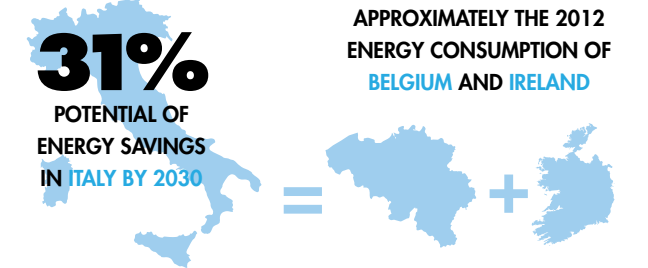
"What are known as 'Excess Winter Deaths' are almost three times higher in

the coldest quarter of housing than in the warmest quarter," said the review.

Governments often introduce fuel subsidies to help the poor pay for heating during the coldest weeks of the year, but this does not make the problem go away.

"Although subsidies may provide temporary relief, they are not a strategic approach," says Barry Lynham, Group Director of Strategy and Communication at Knauf Insulation. "Governments are simply wasting this money if they don't also develop programmes to improve the energy efficiency of homes, reducing bills and eliminating fuel poverty for good."

ENERGY EFFICIENCY FACTS
NUMBERS THAT SPEAK FOR THEMSELVES



CAMPAIGNING for CHANGE

From the United States and the United Kingdom to the United Arab Emirates, Knauf Insulation campaigns to keep energy-efficiency at the heart of public debate in every country where it operates.

UNITED STATES

WHAT? Making recycling mandatory in the state of Indiana

HOW? Knauf Insulation worked hard with NGOs and other businesses to highlight to politicians the economic importance of recycling. When the senate approved the proposal, the recycling law was passed unanimously.

UK

WHAT? Reviving the Green Deal

HOW? The government's Green Deal was designed to finance renovation. It's not working. Knauf Insulation is lobbying for fresh ways to breathe life into the concept including linking house stamp duty – a house sales tax – to a property's energy efficiency rating.

GERMANY

WHAT? Campaign to cut wasted energy in half

HOW? Knauf Insulation supported a pre-election campaign by DENEFF – the voice of the energy efficiency services industry – to cut energy waste by half and hosted visits by politicians at the company's Simbach plant. A parliamentary evening after the elections and joint advocacy with Berlin stakeholders kept energy efficiency high on the political agenda.

FRANCE

WHAT? Renovate 500,000 homes

HOW? Knauf Insulation in France has been supporting the government to ensure that proposed energy laws and new construction legislation does not lose track of the French President's promise to renovate 500,000 homes. Knauf Insulation is also backing an NGO and public sector campaign to alleviate fuel poverty.

BELGIUM

WHAT? Belgian Cavity Wall Campaign

HOW? Knauf Insulation plays a key role in raising awareness of the financial incentives for customers using registered insulation products and installers in the Flanders region. A loyalty-based system was launched for 'Diamond and Gold' installers and government ministers toured the Visé plant. It was estimated that 20,000 Belgian cavity walls would be insulated in the region by the end of 2014. Around half of these will be by Knauf Insulation

SLOVAKIA

WHAT? Unlocking finance for renovation

HOW? Knauf Insulation initiated an alliance of associations called Buildings for Future that has attracted support from Slovak financial incentive schemes. ETS revenues and new Structural Funds will give preference to projects that go beyond minimum energy efficiency requirements for public and multi-family residential buildings.

SLOVENIA

WHAT? Renovation fund lobbying

HOW? Knauf Insulation is continuing to campaign the government for subsidies to be unlocked for energy efficient renovations. With the support of the Slovene Association Fire Protection the company is also promoting new technical guidelines to be introduced to improve building fire safety.

CZECH REPUBLIC

WHAT? National renovation strategy

HOW? Knauf Insulation provided input into the government's nation-wide renovation strategy with a range of expert analysis. Research included a detailed assessment of existing residential building stock.

SERBIA

WHAT? Work on new fire protection regulations for building façades

HOW? A conference organised by the Serbian Fire Protection Association and supported by Knauf Insulation was held to review laws on fire protection in buildings. Attending were the Interior Minister and Minister of Construction. Plans are now underway to form an expert group to work on new regulation on façade fire protection.

CROATIA

WHAT? Public fire tests on different forms of insulation by Zagreb University

HOW? The test supported by Knauf Insulation "shows how EPS thermal insulation can behave devastatingly in a fire, while the façade with non-combustible Rock Mineral Wool insulation had minimal damage and the fire did not spread," said Professor Dubravka Bjegovic of the University of Zagreb Faculty of Civil Engineering, one of the experiment's organisers.

RUSSIA

WHAT? Saving more than 50,000 tonnes of glass being sent to district landfill annually

HOW? Recycling is a new concept in many parts of Russia and in the Moscow suburb of Stupino there was zero glass collection in 2013. Today after working with the local municipality, Knauf Insulation collects 50,000 tonnes of glass annually via 10 local-government supported collection-recycling points.

TURKEY

WHAT? Greater public awareness of energy efficiency

HOW? We are working hard with government ministries, municipalities and non-governmental organisations to educate the Turkish market about the importance of saving energy and saving money.

UAE

WHAT? Supporting the understanding and development of a Green Building Code.

HOW? A Green Building Code became mandatory in the emirate of Dubai. Knauf Insulation hosted a conference for government officials, architects and consultants to talk about how they could develop their green building regulation.

AUSTRALIA

WHAT? Putting retrofits centre stage on the political agenda

HOW? Knauf Insulation has lobbied the Australian Government to include energy efficiency retrofitting as part of the Emissions Reduction Fund and also to put emphasis on energy market reforms as part of the government's Energy White Paper process. The state of New South Wales was also lobbied to include insulation in its Energy Savings Scheme offering incentives to insulate up to 600,000 homes. Knauf Insulation is a member of the Australian Alliance to Save Energy and the Energy Efficiency Council.



Calls to ACTION BY OUR CEO TONY ROBSON

'THE MARKET IS FAILING'

Letter to European Commission President José Manuel Barroso

"If words were action on the cost-effective potential from energy efficiency in existing buildings we would be opening a plant in Europe every month, but today we have no plans to build any additional plants in the region.

"Energy efficiency does not happen by itself. If you don't take a decision to leverage the opportunity that energy efficiency offers... companies like ours will look at other places to spend our resources."

'LIP SERVICE TO ENERGY EFFICIENCY'

Letter published in Financial Times

"The decision to introduce binding European targets for both greenhouse gas emissions and renewables but only an 'indicative target' on energy efficiency had the predictable effect of forcing national governments to focus on the binding targets and only pay lip service to energy efficiency.

"That is why a binding target for energy efficiency must be the starting point for the EU's climate policy for 2030. Increased efficiencies are a must for every business, why should energy be any different?"

'INVEST OR DIVEST; LET ME KNOW'

Letter to all Heads of Cabinet of the European Commission

"An ambitious energy target of 35% doubles the energy security impact of your package, according to the Commission's own analysis. Having had three factories two days from closure during the last Ukrainian energy crisis, it is evident that we need to do all that we can to reduce risk.

"So for Europe and the future of European industry I ask that you be bold and make it clear that you want us to continue to invest in Europe and not look elsewhere for our growth."

Transforming **LIVES**

– one renovation at a time

Insulation saves energy, saves money and helps save the planet. It can also create jobs and boost the economy. Here's how one installation of Knauf Insulation's Blowing Wool SUPAFIL® generated numerous benefits for everyone involved.

A VIEW FROM A HOME OWNER

'WE EXPECT TO SEE PAYBACK OF FIVE TO SEVEN YEARS'

Retired technical director Willy Stulens and his wife Magda have lived in their home in Belgium since 1971. Their house was insulated with SUPAFIL® in October 2014.

"WE INSTALLED INSULATION in our roof about two years ago and saw our energy use cut," says Stulens.

"With the installation of SUPAFIL we hope to save even more. How much will depend on the winter – it's October and we have only just switched on our heating – but we expect to see a payback of between five and seven years. It could be even less if fuel prices increase.

"The installation was €1,500 and we can claim a subsidy from the government in Flanders of about 10 to 15% which is obviously a help.

"I had seen neighbours having SUPAFIL installed and they told me how easy it was to do and that they had felt the benefits very quickly and were saving a lot of energy. Also I was impressed with the work. Their homes had not been left with unpleasant filled-in holes that I'd seen after other insulation installation.

"We're retired and we're in the house a lot more than before with the heating on so it's good to know that we can win back some money as a result of insulation over the next few years."



A VIEW FROM THE WORKMEN

'SUPAFIL GAVE ME ANOTHER CAREER'

Mauro Canini (pictured) and Pascal Boonen have been SUPAFIL installers for three years. They carried out the blowing wool renovation at the Stulens' home.

MAURO CANINI: "I used to be a roof-fitter but the work was very heavy for me and I started to get a bad back. I saw my doctor and he sent me for an operation and told me I couldn't work as a roof fitter again. That was quite a shock.

"It's a long story, but about a year later I met the people at SUPAFIL. The result was that I retrained to become an installer.

"It gave me another career. I can do the work easily despite my back and I plan to do this for many years to come.

PASCAL BOONEN: "I used to work laying paving bricks, but installing SUPAFIL is better work because it is straightforward and there is a lot more demand.

"It's also good business and the money is good. We are busy every day from Monday to Friday and we can do an installation of 200m² every day.

"The customers are satisfied with our work. They are not disturbed and we make sure that nothing can be seen of our work after we have finished."



A VIEW FROM THE INSTALLER

'SUPAFIL CUTS COSTS FOR HOMEOWNERS'

David Houthoofd is General Manager of Iso Protect, a company that offers SUPAFIL Blowing Wool insulation in Belgium. He has eight teams of two installers.

"WE STARTED using SUPAFIL four years ago and have not looked back. With other insulation products there is a lot of messy preparation and you can probably only insulate 100 to 120m² a day, with SUPAFIL we can insulate 220 to 240m² a day and there is no preparation.

"SUPAFIL saves time for us and means we can insulate more houses. This benefit is passed to customers as it means savings of about 15 to 20% in costs compared to other products.

"We find the external installation procedure is very simple, the process is not invasive for homeowners and doesn't risk damaging their properties in any

way. Many customers have told us they felt the benefits of the insulation immediately.

"We were one of the first companies to use SUPAFIL in Belgium and now there are around 220 SUPAFIL machines in the country, so I would say blowing wool has probably created about 500 new jobs for blue collars and about 150 to 200 in back office and sales.

"I HONESTLY believe that much, much more should be done to publicise installation subsidies. And I think what we really need is a clear vision from our government because one day these financial benefits will stop."



A RENOVATION revolution is taking place in Spain and it's being driven by SUPAFIL®.

During the construction boom of the late 20th century, buildings sprang up across Spain, but unfortunately many were built to low insulation standards and were soon in need of an urgent upgrade.

And, until SUPAFIL came along, insulation options were limited.

"There were really only two alternatives: install an interior lining system which would mean losing floor space or ceiling height or install an external wall insulation system," says Knauf Insulation's General Manager in Spain Alberto De Luca.

"The second option would often impact on the façade of the building and in many cases it would not be possible to get planning permission."

Two things were also common

RENOVATION *Revolution*

SUPAFIL® is growing increasingly popular with Spanish homeowners.

to both – the cost in terms of time and money was considerable compared to Blowing Wool.

"Our Blowing Wool systems are very quick, normally just a day. They are cost-effective and a convenient way to increase insulation levels with the minimum of hassle for the customer," says De Luca.

Also in communal apartment blocks, it is possible for individual homes to be insulated rather than wait for a consensus from all

residents to renovate an entire building. For many customers they are also discovering that with payback averaging three to five years SUPAFIL installation is a wise investment.

"It's like buying a new car and someone sending you an envelope of money towards the cost every two months," says De Luca.

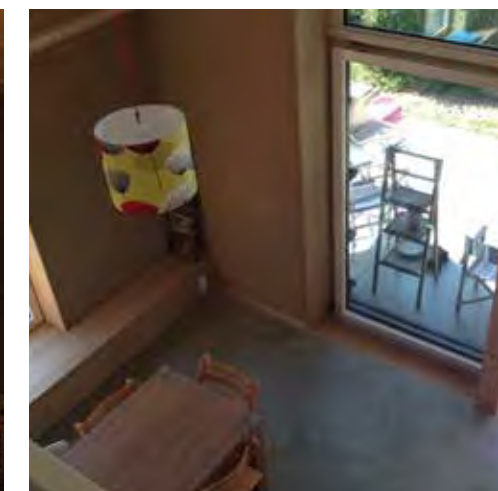
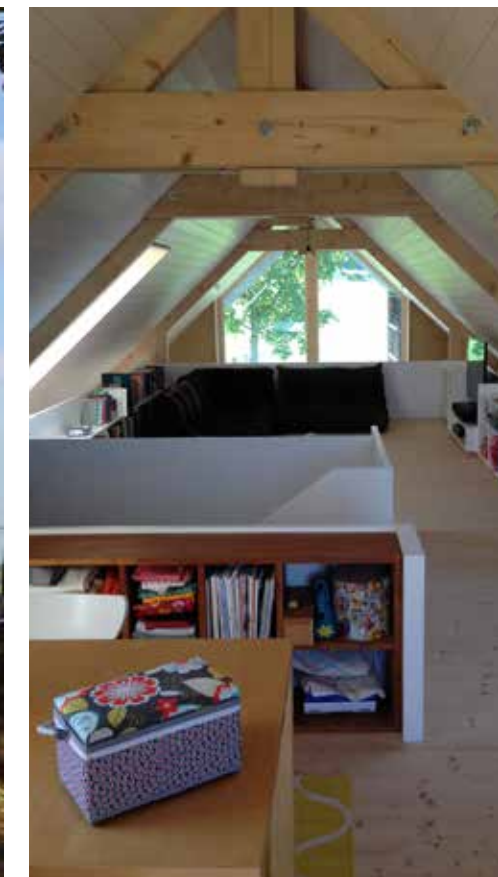
"Basically you bought the item for the immediate benefits it gave you and then the added unique plus of the payback was the clincher."

But De Luca says in addition to financial savings, many Spanish homeowners see the instant benefit of being comfortable – warmer or cooler depending on the season – as being the key value of SUPAFIL.

"Also the fact that we offering a system rather than a product is an important factor in our work," says De Luca. "We are presenting the end user – and installers – with an entire solution, including machinery, material and all necessary technical support."

This allows Knauf Insulation to maintain a maximum level of control over the quality of installations and achieve very high customer satisfaction rates.

"We can safely say that the interest is growing exponentially and the more people become aware of the system and have it installed, the faster the true benefits of its installation are spreading," says De Luca.



BETTER *by* DESIGN

A contemporary timber-framed home featuring Knauf Insulation's Blowing Wool has won a major award for sustainability in Belgium.

THIS STRIKING four-bedroom, 250m² home in the village of Soiron was voted the Walloon Region's best sustainable home in 2012 during its annual survey of 'Exemplary Buildings'.

Created by Knauf Insulation's Visé Quality Manager Stéphane Gohy and his architect partner Gaëlle Libert, the home is officially

recognised as a 'passive house' – a building that is at the cutting edge of ultra-low energy use.

A key definition of a 'passive house' is that it has to be independently certified to consume less than 15KWh per square metre per year or the equivalent of 375 litres of fuel per year. The average for a Belgian

home is more than 2,000 litres.

"In addition to the high thermal resistance of the Blowing Wool it had also been given a Life Cycle Assessment – which examines the extent of its sustainability from cradle to grave – and CSTC, the independent technical advisors to Walloon Region, found it to be as sustainable as recycled paper

insulation," says Gohy.

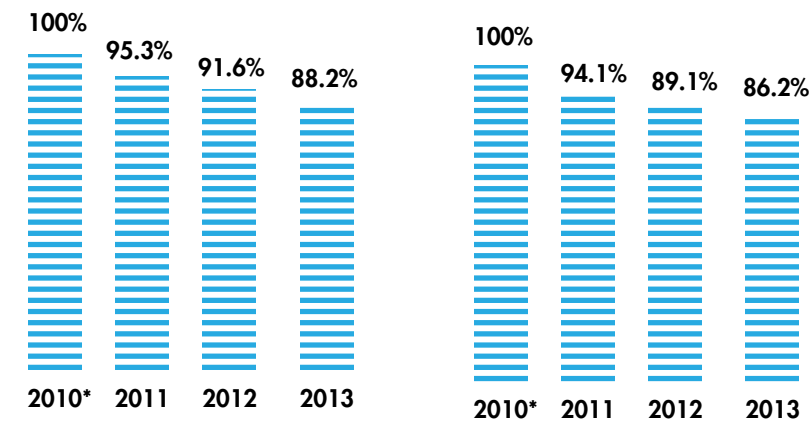
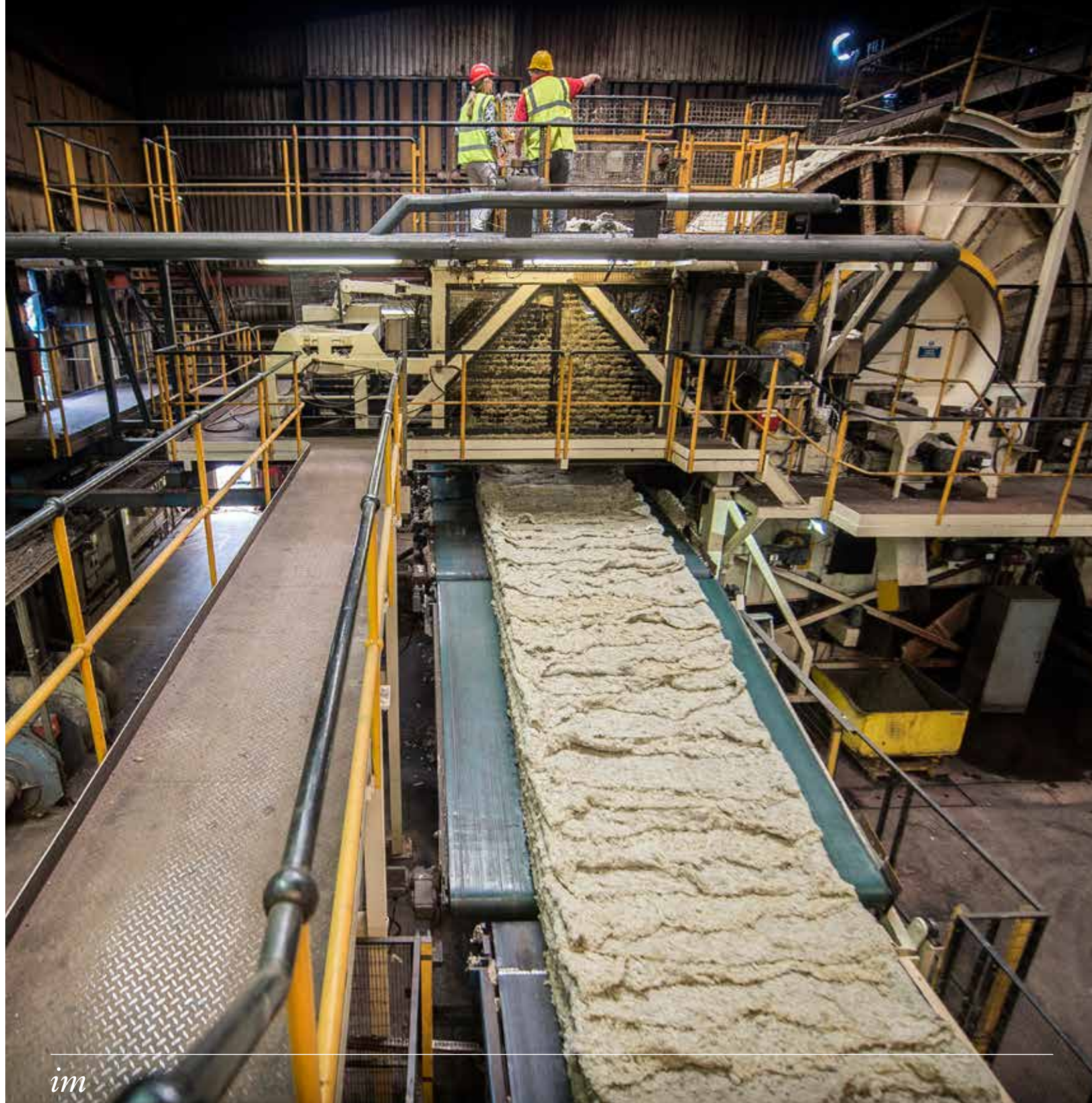
"The width of the insulation is 40cm in the walls and roof and the cost of energy use per year is +/- 280 euros."

Further green credentials of the house were also independently audited and took into account other significant elements Gohy and Libert had introduced such as dry toilets, recycled water systems, eco-friendly design, and innovative land use.

"Sustainability has always been part of our life and creating a family home such as this been a very rewarding experience," says Gohy. "And we are delighted to have our efforts recognised by the Walloon Region."

IT'S TIME TO SAVE OUR ENERGY

We start with our biggest impact; manufacturing. We've learnt harnessing the power of all our people has proved critical in saving energy.



*BASELINE

11.8% reduction in CO₂ (ton/m³) since our 2010 baseline, well on target to a 20% reduction of CO₂ by 2020

MANUFACTURING has, by far, the biggest impact on our energy use and throughout 2013 and 2014 our focus has been on generating greater awareness of energy efficiency in our plants. Part of this included all of the Energy Managers at Knauf Insulation attending training sessions to enable them to become energy awareness trainers at their own plants.

We are changing the mind-set of people. "From re-examining energy use at every stage of our manufacturing process to the behaviour of everyone working here, training has made a major difference as energy is an area where everybody's contribution is vital to making it a success," says Berin Onur, Group Energy Manager of Knauf Insulation.

Energy savings in our manufacturing process have been made right across the board through 'simple' measures like cleaning motors to ensure they are more efficient; reassessing room heating or cooling; improving the condition of windows or doors to improve air tightness and optimising production belts and other equipment so that they run at optimum levels among many other initiatives.

"Good energy awareness has to occur at every level and we are seeing some great results. Looking at our Rock Mineral Wool division for example at Queensferry, Surdulica and Skofja Loka, everyone contributed to a list of energy-saving ideas that are now being worked through by management," says Berin.

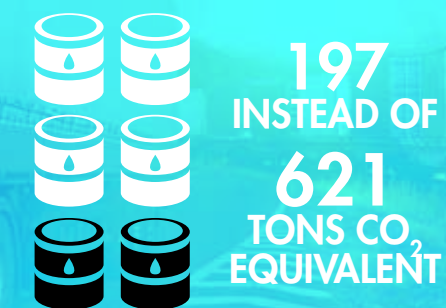
Employee transport, offices and the logistics of our products are the others issues that impact our energy use. In logistics, we're looking at savings made by switching to rail. In our offices, our Sustainable Workplace Initiative is raising awareness about efficiency in the workplace, starting with small steps like standby modes and reminders on light switches.



SAVING CO₂ IN LOGISTICS

Knauf Insulation is reducing the energy used in logistics. In the Czech Republic, we switched from road to rail and saved 424 tons of CO₂ equivalent in the first 15 months. The savings occurred after the plant transferred its distribution of products to Turkey and Romania from road to rail. By using the electric rail network and giant jumbo wagons that have double the capacity of road trucks, the company now needs half the number of trips for distribution, says the plant's Warehouse and Logistics Manager Jitka Rispoli. Over the 15-month period, transportation distances of 1.3 million kilometres were slashed in half and the total amount of CO₂ equivalent was cut from 621 tons to 197. The saved CO₂ of 424 tons is equal to the emissions output from an average car driving around the world a hundred times.

The benefits of importing products from Czech Republic to Turkey and Romania by rail instead of road in the first 15 months:





Recognising Success

It's through the hard work of plants and individuals that we make such great savings in energy. We recognise this hard work at the Annual Energy Managers Awards. Here are the winners for 2013.



BEST SITE

ST HELENS
Energy and Development Manager James Henderson discusses the importance of feedback and data analysis.

What factors contributed to the St Helens site award?

James: Across Knauf Insulation there is a system that allows data to be easily captured and analysed. As well as displaying energy targets in real time, it gives valuable information that allows instant investigation in the event of abnormal usage and reveals the causes of high or low energy use. St Helens was one of the first to implement the system and we have developed a lot of expertise in its use.

How will you maintain your success?

James: St Helens is continually looking at ways to improve and optimise every process on site – operators are encouraged to submit improvement ideas while performance and problems are discussed in daily multi-functional shop floor meetings.

What are your plans for the future?

James: We are constantly trying to improve our processes and over the past few months several trials have taken place and initiatives implemented with encouraging results.

What can others learn from St Helens?

James: I believe we are advanced in the use of our data system. This is a key tool in driving improvement. Ideas and trials also progress very quickly here. Once an improvement is identified and is communicated properly there are few restrictions to it progressing. There is also consistent buy-in from the operators who run the process – without that the system would fail as improvements would not be sustained. The site management team has a key role in facilitating improvement; ensuring that improvement work is aligned to objectives and resources are made available.



MOST IMPROVED SITE

ST EGIDIEN

We can all influence our children's future, says technologist Frank Lindert.



At St Helens, left, and Surdulica, above, everyone is encouraged to generate new energy efficiency ideas

Process technologist Frank Lindert likes to use vivid imagery when describing the importance of energy efficiency. “No snowflake in an avalanche feels responsible. But we all have the possibility to create and influence our children's future. “At St Egidien the biggest energy-saving achievement was to explain – step by step – to every employee our way of thinking when it comes to saving energy from impact to solutions.”



MOST IMPROVED INDIVIDUAL PERFORMANCE

MILKICA BORISOV, SURDULICA
The Surdulica technologist stresses that energy efficiency success depends on the universal buy-in of everyone.

Why did you win the best individual award?

Milkica: I involved every employee in the processes of reducing energy. After receiving the award, the plant had an external audit which stated energy awareness was deeply integrated in all aspects of daily operations as a result of extensive training and a proactive approach by everyone. Everyone at Knauf Insulation Surdulica played a role in reducing energy consumption: the plant manager, the energy purchasing team, the quality control team which defines technological parameters for production, the production team which works within these parameters and promotes effective energy use, the engineering team which is responsible for the proper functioning

of equipment and project implementation, and the finance team, which gives information about the savings achieved.

What challenges did you overcome?

Milkica: Explaining to employees the importance of energy reduction and their influence on energy reduction was a challenge. However, the initiative was fully supported by the group energy manager and plant management team.

What changes made a difference?

Milkica: We started with a monthly HSE checklist, where the energy manager, HSE manager and environmental manager went around the factory together to check the condition of equipment. All corrective actions were then included in the plant integrated action list. Also every day I send a report to the management team stating the previous day's energy consumption so actions can be taken if consumption is higher than normal.

What are your plans for the future?

Milkica: I want to retrain everyone every year about the importance of energy awareness through workshops, quizzes and employee awards as well as continue decreasing plant energy consumption with the involvement of the management team and the whole plant.



BEST INDIVIDUAL PERFORMANCE

TOM MULLEN, SHELBYVILLE PLANT 3
The award is a credit to the entire facility, says the Process, Quality and Energy Manager

“Receiving the award at the energy manager's conference is credit to the united spirit we all collectively have in achieving our sustainability targets,” says the plant's Tom Mullen. “This award is also a credit to the entire Plant 3 facility and its employees who have really engaged in the process of energy conservation over the past few years. “Again I look forward to the next conference to share best practices and meet everyday challenges together in the hope of providing good energy solutions for the plants.” ■

JUMPING for JOY

How renovation cut this family's energy bill in half



THE FAMILY PICTURED above is one of two families that took part in an ambitious six-month experiment organised by Knauf Insulation and scientists in Hungary to see exactly how much money could be saved through renovation.

Two homes, comparable in size and occupancy, had their energy use measured for six months. Sophisticated equipment was installed to monitor the energy usage of both homes from 27 September 2013 to 31 March 2013, with the results automatically updated online every 15 minutes.

The only difference was that one home had just been thoroughly insulated with Knauf Insulation products – 25cm Glass Mineral Wool in the loft and 20cm Rock Mineral Wool boards on the facades. The second house that fell into the lowest 'Category G' of energy efficiency was left untouched.

The result? The family who had undergone the renovation saw their energy bills cut by 46%.

"The house without insulation spent €835 on winter heating while the insulated house spent €455, adding up to a saving of €380," says Knauf Insulation's spokesman in Hungary, László Kanyuk.

"What is significant is that the winter of 2013-14 was unusually warm. The average winter temperature in Hungary is normally 3°C lower. If this had been the case the benefit of the insulated house could have been much higher."

Apply this example in countries with higher fuel prices, or in countries that may be subject to volatile fuel price, and the potential for saving is even greater.

Scientists from the Budapest University of Technology, the Hungarian Energy Efficiency Institute and Pannon Building Workshop Ltd all worked closely on the unique project constantly monitoring the energy use required to keep both homes at 22°C during the day and 19.5°C at night.



BENEFITS OF HOME RENOVATION

Here's how a renovation of wall and roof insulation can benefit a home:

| NON-INSULATED HOUSE | RENOVATED HOUSE |
|--|---|
| <p>Spent €835 on heating</p> | <p>Spent €455 on heating</p> |
| <p>Boiler ran three times more than the renovated house</p> | <p>Boiler ran a third of the time of the non-renovated house</p> |
| 5.5°C – range of indoor temperature variance during the summer | 2°C – range of indoor temperature variance during the summer |
| Category F-G | Category A |
| The lowest category of energy efficiency for a Hungarian home using 400-500 kWh/m ² /year | The highest category of energy efficiency for a Hungarian home using 75kWh/m ² /year |

"We carried out the project because around 85% of homes in Hungary fall into the lowest 'F' or 'G' energy categories that signify obsolete levels of efficiency," says Kanyuk.

The home insulated by Knauf Insulation in the six-month experiment, now a 'Category A' building, consumes 56-75kWh/sqm/year compared to 400-500kWh/sqm/year for a 'Category F' building.

"Around 70% of the total natural gas consumption of an average household in Hungary is used for heating the building," says Kanyuk. "On a national level by making our buildings more energy efficient 40% of consumed energy could be saved along with six million tons of CO₂ emission."

The second house in the project has now also been renovated to the same high standards and looks forward to equally impressive savings this winter.

THE SCIENCE BEHIND THE STUDY

- From September 27 to March 31, 2014, energy use was monitored at 33 points in the homes every 15 minutes adding up to almost 590,000 measurements.
- The two selected were just 7km apart, making the environment comparable.
- An energy efficient home increases in value as it consumes less energy.
- A metrological station was installed in the garden of the insulated house to monitor external temperature.

KEEPING COOL IN SUMMER

Not content with monitoring the energy savings of winter fuel consumption Knauf Insulation also turned its attention to how the two homes behaved in the summer taking measurements from June 1 to August 10 in 2014.

During that period, the outside temperature versus indoor temperature of the two houses was monitored.

The non-insulated house's inside temperature was more reactive to outside temperature changes, than the insulated one. The insulated house's inside temperature varied only in a 2°C degree range (the average internal temperature was 23°C) despite the outside temperature fluctuating between 20.5 and 40°C degrees, while the uninsulated house's inside temperature varied (during the same period) between 21.3°C and 26.8°C.

If a pitched roof area is not insulated, the inside temperature of the roof can heat up to extremes. When the outside temperature was 37°C, the pitched roof area's thermometer in the non-insulated house showed 45°C degrees.



FULL RANGE FOR TECHNICAL INSULATION



Knauf Insulation Technical Solutions, part of the international Knauf group, delivers insulation products and solutions to the industrial, shipbuilding and heating, ventilation and air conditioning (HVAC) markets.

All our efforts are aimed at meeting our customers' needs through a combination of the highest quality mineral wool products, professional advice, reliable service and a strong focus on sustainability.

www.knaufinsulation-ts.com



Make it *EASY* on yourself

The EASY way to great energy efficiency at home.

WHEN IT COMES to helping homeowners become more energy efficient, Knauf Insulation likes to make things easy in every respect.

The company's range of EASY® insulation is designed for do-it-yourself homeowners. Through clear colour coding and straightforward packaging information, it's easy to see which product is ideal for which insulation project and easy to see the energy saving benefits homeowners will enjoy.

The range is also easy to handle due to specially designed carry packs and easy to install, thanks to no-nonsense online guides and in-store product selectors and installation guides that customers can take home.

This in-store support and easily accessible expertise is vital because although many homeowners search for information online, DIY stores are still regarded as an important source of information and advice.

For Wim Lauwerys of Hubo, the fast-growing DIY supplier in Belgium, it was an easy decision to stock the insulation solution in the company's 135 stores.

"There is a lot of insulation information out there and customers may be confused about what to buy especially since insulating your home is something you may only do once in a lifetime," says the Hubo Building Supplies Buyer.

Lauwerys says a common problem for DIY customers is that when they come to buy insulation they don't have all the information they need in an easily digestible form or the insulation support they need.

"EASY's colour coding packaging and instructions speak clearly to our customers and explain which is the right product for the right insulation job," he says.

"It also explains which material you need for which project, whether it's a wall or roof, for example, and what material and thickness is required. This is all backed up with online and video insulation installation support. For us EASY is the perfect product for Hubo because we aim to get as close to the customer as possible."

The DIY market is changing in Belgium, says Lauwerys, today many customers are keen to carry out jobs in the home that used to be done by professionals.

"This means that when customers come to Hubo they are looking for good quality and they want the best, so EASY and the Knauf Insulation fit perfectly with this dynamic," he says.

HUBO is recognised as the outlet of choice for customers who are looking to carry out significant improvements to their homes.

"The future of DIY is bright. Online and through people's phones there are more and more channels open to us to offer our products and expertise that and that can only be good for customers," says Lauwerys.

"Offering customers a streamlined consistent 'omnichannel' shopping experience across all platforms from mobiles and computers to what they see when they walk in a store is becoming increasingly important and Knauf Insulation is committed to making this experience as seamless as possible," says Inge Bommerez, Knauf Insulation's Business Development Manager DIY Retail.

'EASY SPEAKS CLEARLY TO OUR CUSTOMERS AND EXPLAINS WHICH IS THE RIGHT PRODUCT FOR THE RIGHT JOB.'

Hubo Building Supplies Buyer Wim Lauwerys

KNAUFINSULATION **EXPERT**

Knauf Insulation has also developed a specialist range of products for the semi-professional, making it easy to be an insulation expert.

Branded Knauf Insulation EXPERT, the range is perfect for residential use offering professional products combined with colour-coded packaging that makes it clear which product should be used for every insulation project.

Home improvement trends have changed dramatically in recent years particularly as homeowner demographics become older.

EXPERT is proving to be a highly popular choice for those who want to improve the energy efficiency of their homes and are happy to outsource the installation of their insulation to semi-professionals. In-depth advice and installation details are also provided via information leaflets, point-of-sale kits and installation videos, making EXPERT the natural choice for serious DIYers and specialists.



KNAUFINSULATION **EASY**

◆ The EASY website www.knaufinsulation-easy.be offers everything a DIY enthusiast needs to know: discovering how much they will save as a result of insulating their home; finding the right product for their project; discovering how to install the insulation; calculating how much is needed and where EASY products can be bought.

◆ EASY packaging simply explains which product is best for which project, the performance of each product and how to install the insulation.

◆ In each store there are product selectors on shelves and installation guides to take home.

A wide-angle photograph of the Dubai skyline at sunset. The sun is a bright, glowing orb in the center of the frame, partially obscured by a layer of clouds. The sky is filled with soft, golden light, and the clouds are illuminated from below, creating a dramatic, warm atmosphere. The city's skyscrapers, including the Burj Khalifa, are silhouetted against the bright sky. The foreground shows a mix of urban buildings and open spaces, all bathed in the golden light of the setting sun.

Dawn of a NEW ERA

Green building codes offer a unique opportunity to create sustainable buildings. In most parts of the world these are voluntary schemes but in the Middle Eastern emirate of Dubai, sustainable construction is now mandatory. How do Knauf Insulation products measure up?



FROM THE LARGEST shopping mall on Earth to the world's tallest building via the biggest indoor snow ski slope on the planet, Dubai is a Middle Eastern city that likes to push the limits of construction.

But beyond the forests of skyscrapers, the giant man-made islands, plans to build the world's biggest indoor temperature-controlled city and the extraordinary construction that will accompany Expo 2020 in Dubai, there is another ambitious development shaping the city – green building.

Architects, specifiers, developers and construction companies are familiar with the voluntary demands of green building programmes such as LEED, DGNB, BREEAM or HQE among others, but in Dubai green regulations governing

43%
Annual energy savings reported by public buildings in Dubai as a result of the emirate's mandatory green regulations

construction elements such as energy performance, indoor air quality, fire safety, acoustic comfort and resource efficiency have been mandatory for new public buildings since 2010.

In 2014 they became the law for every new building and deep renovation.

It has been a move that has been welcomed by the construction sector particularly in the light that some public buildings reported annual energy savings of up to 43%.

Knauf Insulation recently held a conference in Dubai for government officials, architects, consultants and contractors to showcase how the company's Glass Mineral Wool with ECOSE® technology could contribute to the emirate's Green Building Initiative.

"Dubai is one of the most pioneering cities in the world when it comes to a mandatory green code and at Knauf Insulation we are impressed by its rigorous detail," says Vincent Briard, Knauf Insulation's Head of Sustainability, Products & Buildings.

"The code does not yet consider the full environmental lifecycle impact of products (LCA), which we believe will be a foundation for the future of construction, but it certainly appears to be comprehensive in its scope." ■

HOW WE GO BEYOND DUBAI'S GREEN CODE

At every stage of a product's life there is an environmental impact – from the sourcing of materials to create that product to a product's manufacture, transportation, installation, use and ultimately disposal.

Again, Knauf Insulation is demonstrating its leadership, making available upon request Life Cycle Assessments for most of its products. Now within a few clicks it's possible to characterise the environmental impact of Knauf Insulation products at every stage of its lifecycle.



ECOSE® TECHNOLOGY AVAILABLE IN THE UAE

Less than two hours away from Dubai in Abu Dhabi, the capital of the United Arab Emirates, Knauf Insulation has been operating a joint venture with Exeed Insulation LLC since 2013.

Renamed Knauf Exeed Insulation LLC, the business started producing Glass Mineral Wool with ECOSE® technology in early 2014 and fully converted the production from July 2014.

WHY KNAUF INSULATION'S PRODUCTS ARE A PERFECT FIT FOR DUBAI'S GREEN CODE

| DUBAI REQUIREMENTS | HOW KNAUF INSULATION MEASURES UP |
|--|--|
| <p>Building envelope must have good thermal properties "Building elements forming the external walls, roofs and floors must have an average thermal transmittance which does not exceed a U value of 0.3 W/m²K for roofs and 0.57 W/m²K for external walls."</p> | <p>Our Glass Mineral Wool with ECOSE® Technology is not only softer, easy to cut and non-itchy compared to traditional insulation, it contributes by reducing the risk of thermal bridges, is light and easy to transport and with thermal conductivity as good as 0.034 W/m²K, it offers solutions to meet levels outlined by the code and beyond.</p>  |
| <p>Efficient air ducting and water piping is mandatory "For all new buildings all pipes carrying refrigerant, hot water or chilled water and ducts, including those for conditioned air, must be insulated to minimise heat loss and prevent condensation."</p> | <p>Whatever the type of pipe or duct, the service and products offered by Knauf Insulations' Technical Solutions is the perfect fit. Literally. With easy-to-fit insulation for all pipe lengths and diameters as well as a large products portfolio, our mineral wool products for technical use and for Heating, Ventilation and Air Conditioning (HVAC) combine low thermal conductivity with ease of installation and exceptional fire safety (non-combustible, up to A1 Euroclass standard).</p>  |
| <p>Excellent acoustic performance is mandatory "All new buildings must adhere to regulations restricting internal and external noise pollution."</p> | <p>Our Glass Mineral Wool is perfect for the building envelope and partition walls. When used in construction systems it significantly reduces airborne and impact sound transmission, which are becoming important points of focus in public buildings and the urban environment.</p>  |
| <p>Good indoor air quality is vital "Independently accredited indoor air quality testing must be carried out prior to occupancy and strict limits are imposed for air contaminants such as formaldehyde."</p> | <p>Our Glass Mineral Wool with ECOSE® Technology is a revolutionary binder technology with no added formaldehyde based on rapidly renewable materials instead of petro-based chemicals. We have consistently achieved the highest standards of internationally recognised certification for our products including Indoor Air Comfort Gold (Eurofins) or Greenguard Gold for our Glass Mineral Wool.</p>  |
| <p>All insulation material must be fire resistant "Materials must be fire resistant in accordance with the requirements of Dubai Civil Defence."</p> | <p>Our unfaced Glass Mineral Wool products achieve the highest A1 Euroclass for fire reaction.</p>  |
| <p>Material and waste resource effectiveness is critical "All insulation materials must be manufactured without the use of Chlorofluorocarbons (CFCs), be non-toxic, have 0.05 parts per million or less of added formaldehyde... recycled content and regionally sourced content must each account for at least 5% of the total volume of materials used in the construction of the building."</p> | <p>Our Glass Mineral Wool with ECOSE® Technology supports resource efficiency as it is made using recycled content (up to 80% in some locations), is recyclable at end of life, does not use CFCs and the binder technology has no added formaldehyde. Furthermore, thanks to the proximity of our Abu Dhabi plant, our products can be considered as 'locally sourced' for Dubai.</p>  |
| <p>Green roofs may be mandatory "All roofs including open areas shades must have a minimum roof solar reflective index of less than 29 for roofs with a slope steeper than 1:6 and less than 78 for flat roofs. For all new buildings these requirements are waived if the roof of the building is provided with a vegetated roof (green roof) for at least 30% of the total roof area."</p> | <p>Knauf Insulation's green roof system Urbanscape has already been impressing developers in Kuwait with a project to bring greenery to barren areas of desert. But perhaps more importantly in a city where water is precious, Middle East test cases have revealed that Urbanscape® with polymers can contain up to 122% more water than sites without the material. Undoubtedly, the solution will be a major success in Dubai.</p>  |

Above & BEYOND

The trend for green roofs is growing across the world. Knauf Insulation's Urbanscape® has the right solution.

CHICAGO'S CITY HALL was built to impress. Finished in 1911, this giant 11-storey statement building exudes urban authority and municipal gravitas from every classic column and granite block.

But high above, hidden from view on the roof, it's a different world.

In 2001, an astonishing 2,100m² urban oasis was created as one of the city's first green roofs to demonstrate the benefits of green roofs. Today it's a place where more than 150 different species of 20,000 plants, shrubs, vines and flowers thrive.

Green roofs have been around since stone-age communities covered their homes with turf, but now they are a growing urban trend across the world's cities, inspired by a desire for a better environment as well as financial incentives and even legal requirements.

In 2012 Shanghai had 1.45 million m² of green roofs thanks to municipal financial support schemes while grants and subsidies have allowed green roofs to flourish in the German cities of Munich and Stuttgart, the Austrian centres of Linz and Vienna as well as the Dutch cities of Amsterdam, The Hague, Groningen and Rotterdam.

Meanwhile, in Singapore the equivalent of 84 football fields of roof across 500 buildings have been greened as part of the city's Skyrise Greenery Incentive Scheme and in America the cities of Portland and Washington have announced ambitious green roof incentives that are spreading rapidly throughout urban districts.

New green roof laws are also being

introduced around the world. In Toronto green roofs are now required on all new buildings with a minimum floor space of 2,000m². In Copenhagen all new roofs with a pitch under 30 degrees have to be landscaped (see box-out story).

The reason for this growing trend is clear. As Chicago demonstrated, green roofs support biodiversity by providing habitats for birds, animals and plants; they lead to larger quantities of rainwater being absorbed in a sustainable way – between 50 and 80% of annual rainfall – and this delay takes pressure off sewers and lowers flood risk.

Green roofs also absorb CO₂, keep buildings and the surrounding air cooler in boiling summer and curb what is known as Urban Heat Island effect where built-up areas are hotter than surrounding areas.

Of course there are social advantages as well, roofs are being transformed into green children's parks, vegetable gardens, running tracks or just tranquil places in which to relax.

Ultimately, green roofs improve living standards and make cities more pleasant places to enjoy.

Just look at Chicago today. The garden inspiration of the City Town Hall has really taken root now. By 2014 there were more than 360 vegetated roofs in the city including the extraordinary 24-acre Millennium Park built on the roof of the Millennium Parking Garage that has spaces for 2,200 cars.

In all respects green roofs are becoming a growth business. And that's good news for everyone. ■



The pioneering green roof of Chicago's City Hall. Today there are more than 360 vegetated roofs throughout the city

NATIONAL GEOGRAPHIC/GETTY

Rain, floods and social togetherness

COPENHAGEN'S Chief City Architect Tina Saaby Madsen tells *Insulation Matters*: "Due to the growing challenges of cloud bursts and flooding green roofs are a growing trend worldwide.

"In Copenhagen we try to do more than just delay rainfall runoff. When a lot of people move to the cities – Copenhagen's population increases by a thousand new inhabitants a month – the need for green areas rises and it can be hard to find the space for them, which is a priority for the city.

"That is why we try to use the green roofs as a place for activity and social togetherness, for example, as seen in a project from Birkegade where residents have a big roof garden including outdoor kitchen, a little hill covered in grass and an open space which is child-friendly.

"The main idea is to combine practical use when heavy rain hits, the biodiversity green roofs offers and the possibility of more nature in a big city. Furthermore it has a great effect on cooling buildings and that helps in our goal of becoming the world's first CO₂-neutral capital in 2025."

Height of SUCCESS

Nine great reasons to install Knauf Insulation's Urbanscape® Green Roof System.

1 LIGHT WEIGHT

Compared to traditional soil substrates, Urbanscape is up to 10 times lighter.

2 CUT EMISSIONS

Urbanscape naturally absorbs up to 5kg of CO₂ for every square metre per year – the equivalent of the CO₂ emitted by an average car driving 80km. This helps cool buildings and the surrounding air through water evaporation. This in turn reduces Urban Heat Island effect, where densely built-up land can be up to 5 to 7°C hotter than those in the countryside.

3 EASY TO INSTALL

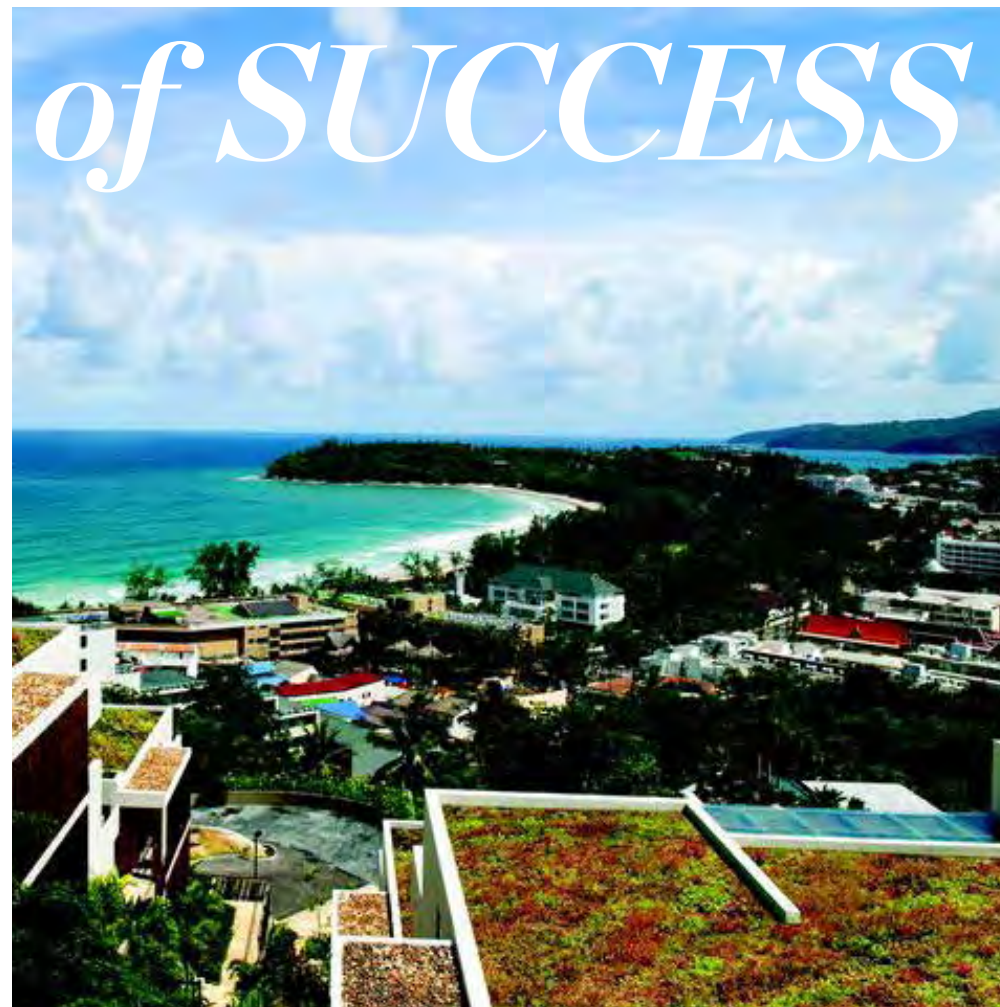
Urbanscape is lightweight and easy for anyone to install in just a couple of hours, but the benefits will last for years in the form of lower energy bills and a huge positive contribution to sustainability.

4 REDUCE STORM STRESS

Urbanscape's unique innovative mineral fibre substrate reduces stress on sewer systems by storing up to three times more storm water than traditional green roof substrates. A four-centimetre-thick Urbanscape substrate can hold up to 30 litres of water per square metre.

5 ENJOY CLEANER AIR

Plants on green roofs not only filter collected rainwater but they also capture airborne particles including heavy metals and smog. Research has estimated that a square metre of green roof can absorb 0.2kg of airborne particles from the air every year.



6 TUNE OUT NOISE

By absorbing both external and internal noise, green roofs make excellent sound insulators. Research by the British Columbia Institute of Technology and the University of British Columbia found that the "high mass, low stiffness and damping effect" of green roofs dramatically reduces noise pollution.

7 EXTEND ROOF LIFE

Green roofs can dramatically extend the life of roofs by reducing the impact of extreme temperatures or ultra-violet radiation. From night to day, roofs can contract due to changes in temperature. Green roofs dramatically reduce these fluctuations. Studies in Toronto in Canada found non-green roofs reached temperatures of 70°C in the afternoon compared to greened roofs that reached just 25°C. The researchers said this reduced stress had the potential to extend the life of the roof membrane by two to three times.

8 GO FROM GREY TO GREEN

Green roofs have created new urban play areas for children, unusual parks, gardens and areas of relaxation. This is good for the environment and good for creating more green spaces in urban environments, but green roofs also make people feel better. At some hospitals such as Baltimore's Mercy Medical Center in Maryland or Oregon's Centre for Health and Healing in the States, green roofs have been introduced to enhance the 'healing' environment for patients.

9 SAVE ENERGY

Urbanscape is an effective insulator and can save energy used for heating and for cooling. It is commonly known that in summer, the green roof cooling effect can reduce energy consumption for cooling/air conditioning by up to 75%. We have performed extensive Urbanscape performance tests with top researchers in this field and found better-than-expected results. During the summer, energy/heat flow through the roof into a building can be reduced to zero or can even be negative due to the evapo-transpiration effect. This means that our green roof system design is preventing heat entering the building and also working as an air-conditioner.



OFFERING ARCHITECTS MORE OPPORTUNITIES

Project: Eco Silver House is a passive development of 128 residential units in the heart of the Slovenian capital of Ljubljana. A total of 800m² of Urbanscape Green Roll was installed directly on gravel under PV panels. As well as cooling the building, the green roof accumulates and filters rainwater which is collected and used for flushing toilets

Feedback: "Urbanscape is a user-friendly and lightweight solution with impressive performance and additional benefit in terms of the simplicity of

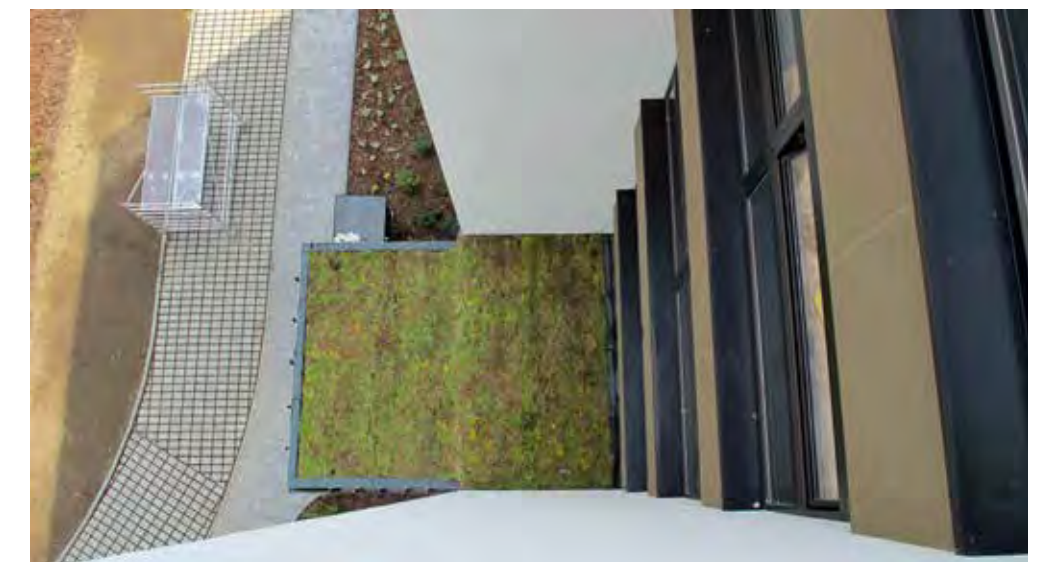
the system installation, maintenance and improved storm water management," says Borut Slabe of Akropola, Eco Silver House architects.

"By choosing the vegetated Urbanscape roof on the top of Eco Silver house, combined with PV panels, the ecological footprint of the building is improved and overheating of the roof structure in summer is prevented. With Urbanscape green roof system solutions, architects can offer clients more opportunities in terms of design, technical and environmental criteria."

ENHANCING APARTMENT VIEWS

Project: Based in the quiet Prague district of Malešice, Ecocity is a set of five passive residential buildings encompassing 110 apartments developed with the aim of "having minimal impact on the environment". Urbanscape Green Roll was used on a total roof area of 40m² at Ecocity. The installation is the first Urbanscape reference case in the Czech Republic.

Feedback: Comments from owners and investors have been positive with the green roof system being described as improving views.



IMPROVING THE OFFICE CLIMATE

Project: Management at the Knauf Insulation plant in Oosterhout in the Netherlands wanted an environmentally friendly 'green roof' on one of their office buildings that was strong enough to walk on but had superior drainage performance. Around 300m² of Urbanscape Green Roll was installed along with a drainage system made from Heraklith® Wood Wool Agro board.

Feedback: "Since we installed the system on our offices we have observed a good performance in terms of climate conditions in the premises with a more stable temperature even during warm days," says general manager Jeroen Verweij. "The green roof doesn't require any special maintenance for the plants to grow throughout the year – plus it looks great."

Our EPD fast-track

An EPD - Environmental Product Declaration - is the best way to assess a product's environmental impact because it examines in forensic detail every stage of its life-cycle. The process used to take six months or more. Knauf Insulation can now deliver EPDs in as little as 15 days.

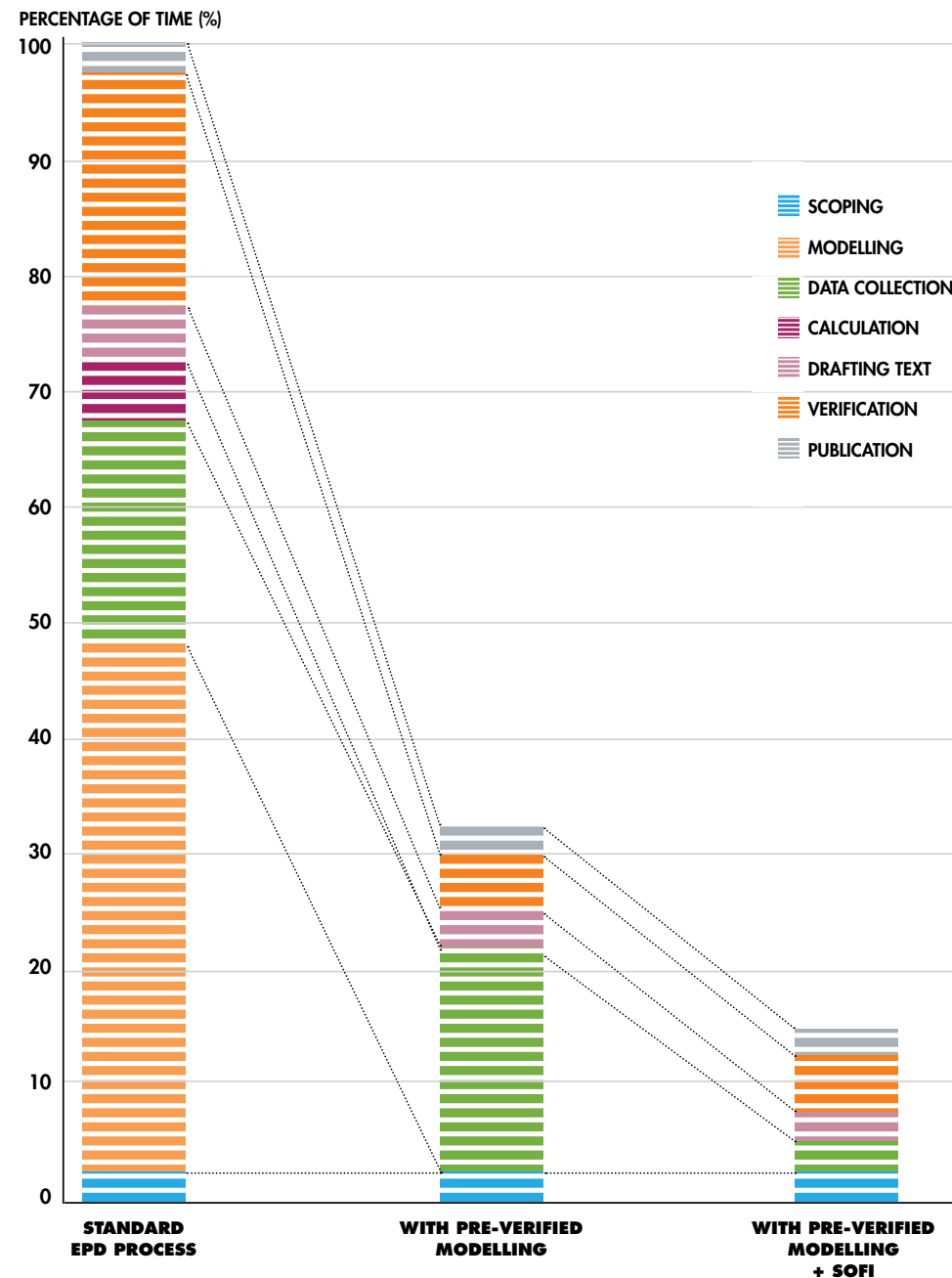
120 DAYS
Time for a standard EPD

32 DAYS
to provide any EPD, with our pre-verified modelling

15 DAYS
to provide any EPD, with our pre-verified modelling and data collection software

WITH PRE-VERIFIED MODELLING AND DATA COLLECTION SOFTWARE, EPD delivery times FOR MANY OF OUR PRODUCTS have been cut by up to 85%

HOW WE'VE STREAMLINED THE EPD PROCESS AND IMPROVED OUR SERVICE TO THE MARKET



UNDERSTANDING THAT buildings must be low energy is a first step in reducing the environmental impact of buildings. But when it's time to choose between which insulation materials to use, it might seem hard to know what to look for.

When it comes to the sustainability of our products we believe that knowledge is power. An Environmental Product Declaration (EPD) is the best way to assess the environmental impact of a product because it examines in minute detail every stage of its life-cycle, from cradle to grave.

Why? Because more information about a product's sustainability empowers us to improve our manufacturing processes, but it also allows those deciding which construction products to use in a build to select the more sustainable products, leading to better buildings and a better environment.

So, how do you choose? When it comes to sustainability we believe there is no such thing as too much information. There's a lot of information to digest, but we're pioneering new ways of providing customers with that information faster than ever before and in digestible new ways that are easier than ever to understand.

"We have numerous EPDs available for our product range, which is already a massive achievement in itself. But Knauf Insulation doesn't just have several products; it has thousands," says Vincent Briard, Knauf Insulation's Head of Sustainability, Products & Buildings.

What's more, the products and solutions we provide evolve. If a new product comes along that an architect or customer wants in their project and they need an EPD to do so, it could be up to a six-month wait.

But at Knauf Insulation we have dramatically cut the time frame by pre-verifying the modelling stage of the EPD production process for many Glass and Rock Mineral Wool applications, reducing time between request and publication to as little as two weeks wherever our innovative data collection process has been implemented.

"Knauf Insulation has always believed that as a pioneer of sustainability it has to provide customers with the most comprehensive data available," says Briard. "This innovation demonstrates our continuous commitment to do so." If you want to know about product sustainability, let Knauf Insulation be your guide.

10 reasons why EPDs are important today

When it comes to sustainability we believe that there is no such thing as too much information that's why we believe an EPD is the best way to assess the environmental impact of a product.



CLEARER PICTURE

By focusing on the environmental impact of a product across its entire lifecycle from raw material sourcing, manufacture, use and disposal, we give our customers the whole picture of a product's sustainability not just a snapshot.



MARKET DEMANDS

The market is changing and more and more customers are starting to demand more information about our products. Environmental Product Declarations provide that information. As a result they are shaping the market and we are spearheading that change.



MODEL PERFORMER

At the heart of the future of construction are sophisticated 'modelling software systems' which carry out the advanced calculations required to assess how sustainable a building will be before it's even built. Systems such as 'Building Information Modelling' (BIM) need product data based on EPD.



FASTER SERVICE

EPDs used to take months to produce because of the amount of data they processed. We've made the process faster than ever when it comes to producing an EPD for one of our products. What's more, we're supporting the concept of an EU core EPD, which will allow, through harmonisation, EPDs of products from one country to be recognised in other countries.



WHAT'S INSIDE COUNTS

Buildings are now more energy efficient than ever. This is great for the planet. As it reduces the relative impact of the 'use phase' of buildings, the impact of what goes into a building is becoming more important.



BETTER DETAIL

When calculating the environmental performance of a building it's vital to understand the impact of every product that goes into it. And that means knowing about their lifecycle assessment (LCA). Where will you go to find out more? Yes, indeed. An EPD.



INFORMATION CHOICE

Product sustainability is complicated. It can't be encapsulated in a logo, label or single word. And that's why EPDs are so important. However, we have identified that for situations such as laminated products (ie Wood Mineral Wool and Rock Mineral Wool) and OEM products a more flexible tool would be useful for the market. Knauf Insulation has introduced Environmental Fact Sheets. An EFS distils the essence of a product's environmental impact over its lifecycle into three pages of information based on data from verified EPDs.



RECYCLING ACHIEVEMENTS

Our Glass Mineral Wool is made of up to 80% recycled glass and both our Rock Mineral Wool and foam manufacturing plants achieve almost 100% waste recycling. We are proud of our recycling achievements. But recycling is just one factor in the life of our products. By using EPDs we can identify many other areas – as well as recycling – where we can minimise our environmental impact.



HIGHER STANDARDS

Our products are endorsed by some of the most demanding certification organisations in the world, for example, the stringent 'Indoor Air Comfort - Gold' requirements of Eurofins or Greenguard Gold. When considering the environmental impact, there are a number of green labels available, however, these labels often focus on just one characteristic of a product. An EPD provides a fully rounded picture.



GREEN SCHEMES

EPD data is already being fed into green building schemes such as BREEAM, HQE and DGNB. And the latest version of LEED rewards EPD data with extra credits.

For more information about our EPDs visit: <http://www.knaufinsulation.com/en/product-sustainability>



Let's talk: SUPPLY CHAIN MANAGEMENT



OUR STRATEGY

WE RECOGNISE that suppliers are a vital component in helping us achieve our sustainability objectives, whether that be our commitment to a 20% reduction in CO₂ by 2020 or by increasing levels of recycled content in our products.

In a time of crisis, there are many challenges but we believe collaboration throughout our supply chain is essential in advancing our sustainable growth.

When it comes to improving the sustainability of a company and doing things better, improving every detail of every part of a supply chain adds up to making a significant difference.

From fundamental changes to packaging to simple efficiencies in a process we are addressing our supply chain impacts. Managing that chain starts with mapping it out, that's why we're working with our major suppliers to find out how they manage quality, safety, environment and quality risk.

At Knauf Insulation there is still plenty of work to be done and as our supply chain management programme develops, we will increase the range of sustainability issues covered.

DOING MORE WITH LESS

By becoming more energy efficient in our operations, 1 unit of energy used to make the product now saves more than before

2008 1 Unit of energy USED = SAVES 489 Units of energy

Today 1 Unit of energy USED = SAVES 570 Units of energy

OUR CONTRIBUTION TO A CIRCULAR ECONOMY

OUR PRODUCTS save energy and resources – far more energy and resources than are required to produce them. What's more, we are committed to ensuring that our products and solutions are produced using the least amount of resources. In 2008 our typical Glass Mineral Wool product would go on to save 489 units of energy for every unit used to produce it. Now, the same product

saves even more – 570 units of energy saved for every unit used to produce it!

Furthermore, to transport our products, we have developed compression technology and that means it takes less energy to transport more product. We are also working on how to deal with insulation at the 'end-of-life', including looking at construction and demolition waste.

SUPPLIER BECOMES

THE SUPPLIER:

OUR PRODUCTS IN GREEN BUILDINGS

In LEEDv4, a credit can be gained by choosing products from manufacturers that report on raw material source and extraction.

We do just that. We're a manufacturer that publishes an annual sustainability report guided by GRI level 'C'.

And as a responsible manufacturer there are other contributing factors. Knauf Insulation has four of the most important International Management Standards for sustainability; ISO 9001 (Quality Management), ISO 14001 (Environmental Management), ISO 50001 (Energy Management) and OHSAS 18001 (Health and Safety Management) for all our plants in Europe, Russia and CIS.

Our international management standards are certified by one of the leading conformity assessment organisations, Bureau Veritas and we have a supply chain management programme.

OUR IMPROVEMENTS AT A GLANCE



PACKAGING

In 2014 Knauf Insulation switched a type of film it used to wrap insulation to a thinner film. The change cut the amount of film used by 27.3%. Compared to the previous film, 0.766kg less CO₂ emissions

is caused per kilogramme by the thinner film. This adds up to a reduction of 23.4% of CO₂ emissions.

E-INVOICING

Knauf Insulation's Central Purchasing Organisation is

requesting all its suppliers in Germany to change its processes and procedures to provide invoices as an electronic PDF file rather than a paper copy. This is one of many signals of intent to pursue more sustainable

practices at all levels. After a successful starting phase we'll continue to roll it out across the organisation in 2015.

LOGISTICS

◆ We have used recycled plastic since 2004 and

recycled pallets since 2005 in our UK operations.

◆ Supakube advanced compression technology, introduced in 2009, allows customers to receive more product per full load with fewer trips between a job

site and warehouse.

◆ Transport companies are asked to ensure proper fleet management systems to ensure regular update of their trucks to European standards. These requirements are

standard prerequisite in the company's purchasing policy and integrated within its tendering processes.

◆ We recently completed a major upgrade of stitching and packaging

technique changes in pallet sizes and improvements in packaging techniques, which allowed a 30% increase in technical insulation product per pallet, lowering freight costs and reducing our environmental footprint.

◆ Our durable Master Bags in North America protect products from damage and allow more efficient and safer use of warehouse stacking space.

WAR ON waste

Knauf Insulation has slashed landfill waste by nearly 50% in four years.

KNAUF INSULATION has dramatically reduced the amount of waste it sends to landfill by nearly 50% in the space of just four years. Despite the fact that the company also acquired new plants in 2013, waste fell from 81,000 tons in 2010 to 45,000 tons in 2013. This success is being fuelled by reductions in the amount of Glass Mineral Wool (GMW) waste sent to landfill per ton, which has been cut by more than half since the 2010 baseline. ▶

From road foundations to the creation of ceiling tiles, we are constantly finding new ways to reuse compressed Glass Mineral Wool waste



MOTORWAYS, TILES AND CIRCULAR ECONOMIES

Knauf Insulation is constantly on the lookout for new ways to recycle its waste. In the UK bales of compressed Glass Mineral Wool waste are used in the construction of road foundations, across the company, this waste is also used to create ceiling tiles.

There are also experiments in recycling insulation that is removed from demolished buildings – the ultimate example of a circular economy where at the end of a product's life it returns to be recycled.

"There are immense challenges in taking back insulation from construction sites. What we don't want to do is take something back which we'll ultimately have to send to landfill, as that would be adding additional distance to its disposal and essentially less sustainable than if it had been sent straight to landfill from the construction site. But we are examining this process as well as working out how we can design our insulation to be easier to dispose in future demolition; this is eco-design," says Philippe Coune, Knauf Insulation's Group HSE Manager, Performance and Sustainability.

WE'VE REDUCED OUR WASTE TO LANDFILL BY 49.1% SINCE OUR BASELINE YEAR.

WE CAN ESTIMATE THAT WE'VE AVOIDED USING

245 TRUCKS



THAT DRIVE ON AVERAGE A **100KM** to reach the landfill area.

THAT'S A LOT OF FUEL THAT HASN'T BEEN USED, AROUND **73,500 LITRES**



THAT'S ENOUGH FUEL TO DRIVE **ROUND THE WORLD IN A CAR 31 TIMES**



In 2013 just 40kg per ton of GMW product was wasted compared to 79.6kg per ton in 2012. Across all Knauf Insulation plants in all regions, product waste plummeted from 98.6kg per ton in 2010 to 37kg per ton in 2013.

"Knauf Insulation has invested significantly in technologies across the company that have made a significant difference to the re-use of our scrap Glass Mineral Wool, with waste from Glass Mineral Wool now down from 39,000 to 29,000 tonnes from 2012 to 2013," says Philippe Coune, Knauf Insulation's Group HSE Manager, Performance and Sustainability.

Coune also underlines other major achievements across Knauf Insulation that have contributed considerably to that impressive overall 50% reduction in three years.

For example, in the UK, Knauf Insulation's four plants at St Helens, Cwmbran, Queensferry and Hartlepool have not been sending any waste to landfill since mid-2013.

In North America, despite Knauf Insulation's recent acquisition of Guardian Insulation and the re-opening of the Lanett plant, waste to landfill was reduced by 2,000 tons, year on year to 2013. Knauf Insulation has also cut the amount of hazardous waste that is produced by its manufacturing processes by 15%.

So what is driving these achievements? Communication. "In 2012 we introduced a central data collection system

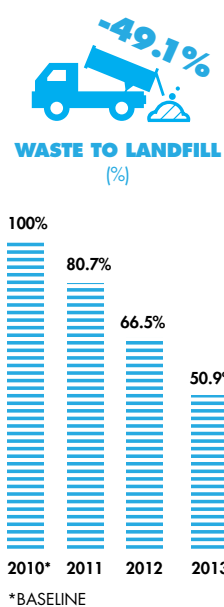
that improved the monitoring of waste," says Coune.

"What that means in effect is that everyone has to produce a monthly dataset on how much waste is being generated and what will be done with it. This in turn creates awareness, we are talking about waste continuously across the company."

Perhaps one striking figure illustrates the success of this communication. In just a year waste to landfill across the company was cut by almost 20% from 2012 to 2013.

"Knauf Insulation takes a life cycle approach to environmental impact," adds Coune. "For example, transportation is also linked to waste to landfill. By decreasing our waste to landfill by 49.1% we can estimate that we've avoided using 245 trucks that drive on average a hundred kilometres to reach the landfill area. That's a lot of fuel that hasn't been used, around 73,500 litres."

We identified two other contributing factors to waste at Knauf Insulation; our packaging and of course our offices. We continue to investigate new packaging technologies. As for offices, through the Sustainable Workplace Initiative – implemented company wide in 2014 – recycling bins have been made standard where recycling collection is available. The switch from water bottles to water fountains through this initiative has also helped to reduce the amount of waste created by our offices. ■



We want your rubbish

Knauf Insulation is spearheading glass recycling initiatives in the US and Russia.

KNAUF INSULATION IS

continually exploring new ways to encourage glass recycling and in the past year initiatives in Russia and the US highlight how it's possible to make a difference.

In early 2013 there was zero glass collection in Stupino, a Moscow suburb city of 80,000 people. Now with the backing of the local authority, Knauf Insulation has introduced 10 bottle recycling collection points around the district that contribute glass to the company's Stupino plant.

"The local impact has been considerable. Knauf Insulation is now saving more than 50,000 tons of glass being sent to district landfill every year," says Dmitry Kalinin, Knauf Insulation's Regional Health Safety and Environment Manager.

RUSSIAN SUCCESS

10 BOTTLE COLLECTION points have been introduced in Stupino

Around 50,000 TONS of glass now saved from landfill annually

Around THREE TO FIVE TONS of recycled glass goes to Knauf Insulation's Stupino plant every month

In the US, Knauf Insulation played a key role in the introduction of a law that makes recycling mandatory for 50% of waste produced by the 6.5 million people living in the state of Indiana.

"In just over a year we changed the law in Indiana. I'm incredibly proud of what we have achieved," says Scott Miller, Knauf Insulation's Director of Sustainability, North America.

"Recycling is not at the forefront of many American minds and it is only mandatory to recycle in 11 states. That leaves 39 that still need to be convinced of the good business sense of recycling."

Knauf Insulation worked closely with other businesses and non-governmental organisations to highlight to politicians the economic importance of recycling. When the senate approved the legislation, the law was passed unanimously. Both initiatives demonstrate the importance of gathering support to ensure success.

"We were lucky at Stupino because the administration was progressive, understood the importance of our collection points and supported the initiative with extensive effort. We are now keen to see the scheme replicated in nearby districts," says Kalinin.

CHANGING STATE LAW

Recycling is now mandatory for 50% of waste produced in Indiana thanks to work by Knauf Insulation

A MILLION BOTTLES are recycled every day at the Shelbyville Plant

Further reinforcing Knauf Insulation's credentials as a recycling innovator in Russia, new technology has been introduced at the Stupino plant that identifies and removes problematic foreign matter from recycled glass during production.

"The technology means that we can increase the range of recycled glass we process," says Kalinin. "It is no exaggeration to say that most of the glass that is thrown away in Stupino ultimately ends up as energy-saving Knauf Insulation."

The social importance of recycling cannot be underestimated. "Recycling creates jobs and saves jobs," says Miller. "A study by the Bowen Center of Public Affairs at the Ball State University found that state-wide recycling in Indiana would create new employment for at least 10,000 people."

And of course Knauf Insulation's North American plants rely heavily on 50% of recycled material for product production.

"In Shelbyville about 700 jobs depend on recycled content," says Miller. "We process more than a million bottles for recycling every day and the plant works 365 days a year 24/7. That's a lot of bottles."

Following the success of the Indiana bill, Miller is determined to push through similar legislation in other states. "On a national level it's sometimes hard to get your voice heard, but on a state level I feel that Knauf Insulation can really make a difference."



HAIRDRYER ECONOMICS OF ENERGY

"The value of recycling one beer bottle by Knauf Insulation represents the equivalent energy saving of switching on a hair-dryer for 10 minutes," says Scott Miller, Knauf Insulation's Director of Sustainability for North America at Shelbyville, Indiana. "At Shelbyville we recycle more than a million bottles a day and the plant works 24/7 for 365 days a year, so our annual saving is about 70 million kilowatt hours of energy every year."

FIRE SAFETY'S FATAL FLAWS

Europe is sitting on a ticking time-bomb of building fire risk



70,000

people are hospitalised every year as a result of fire



In the 1950s it would take around 15 minutes for a full blaze to take hold, but today a big fire can be out of control in under three minutes

4,000

people are killed as a result of fire every year, most from smoke

€126 BILLION
of the EU's GDP is lost every year as a result of fire



The cost of fire damage has risen by 17-18% each year for the past three years although the number of fires has not risen

660 MILLION

hotel room nights are sold every year, but the last time the EU examined hotel fire regulations was in 1986

90%
of our time is spent in buildings, 90% of fires in Europe happen in buildings

IN MAY 2012, 19 people including 13 children died in a fire that swept through a Qatar shopping mall. A year later, 242 were killed in a nightclub fire in Brazil. In January 2014, 32 pensioners died in a blaze at a care home in Canada.

THREE DISASTERS on three different continents in three years but with two common factors – they all took place in a building crammed with people and in each case investigators raised serious questions over the fire safety of that building.

How long before we see a similar disaster in Europe?

“Europe is sitting on a ticking time-bomb as far as building fire risk is concerned,” says Juliette Albiac Managing Director of Fire Safe Europe (FSEU) an organisation actively supported by Knauf Insulation. “Every year 4,000 people are killed and 70,000 severely injured as a result of fires in Europe.”

Modern buildings and the materials used to construct them have changed beyond recognition over the past 30 years and although this has inspired great innovation, building fire safety regulations have failed to keep pace.

For example, the last time the European Commission addressed fire safety in hotels was in 1986 and test methods for construction product safety have not been revised since

2002 (based on data collected from 1994 onwards).

“For instance, there is no common European standard test method to ensure that external wall systems are safe,” says Barry Lynham, President of Fire Safe Europe and Group Director of Strategy and Communication at Knauf Insulation.

“When international scientists and engineers carried out tests on these systems in Croatia recently (see story on page 54) they had to use a British standard because an EU standard simply didn’t exist.”

AS BUILDINGS are renovated across Europe we change their nature, so it is vital that there are standards that reflect the real life performance of external wall systems, says Lynham.

“Also as borders open up more, construction workers become more mobile working in different countries that have different national standards, so unnecessary risks are being created.” ▶



THE EUROPEAN PARLIAMENT PUTS FIRE SAFETY FIRST

A total of 70 European Parliamentarians standing for election in 2014 pledged their support to put building fire safety at the heart of the EU’s political agenda. The move followed a campaign by Fire Safe Europe – actively supported by Knauf Insulation – to highlight the need for new Europe-wide legislation to tackle irregularities in safety levels across the EU; the need to update regulations with regard to new construction techniques and materials; and compile detailed EU-wide research data so future legislation can be based on sound science.

“Many MEPs are surprised to learn that there are no Europe-wide initiatives for fire

safety in buildings,” says Juliette Albiac Managing Director of Fire Safe Europe. “But when the EU does take action on safety it can be hugely successful.”

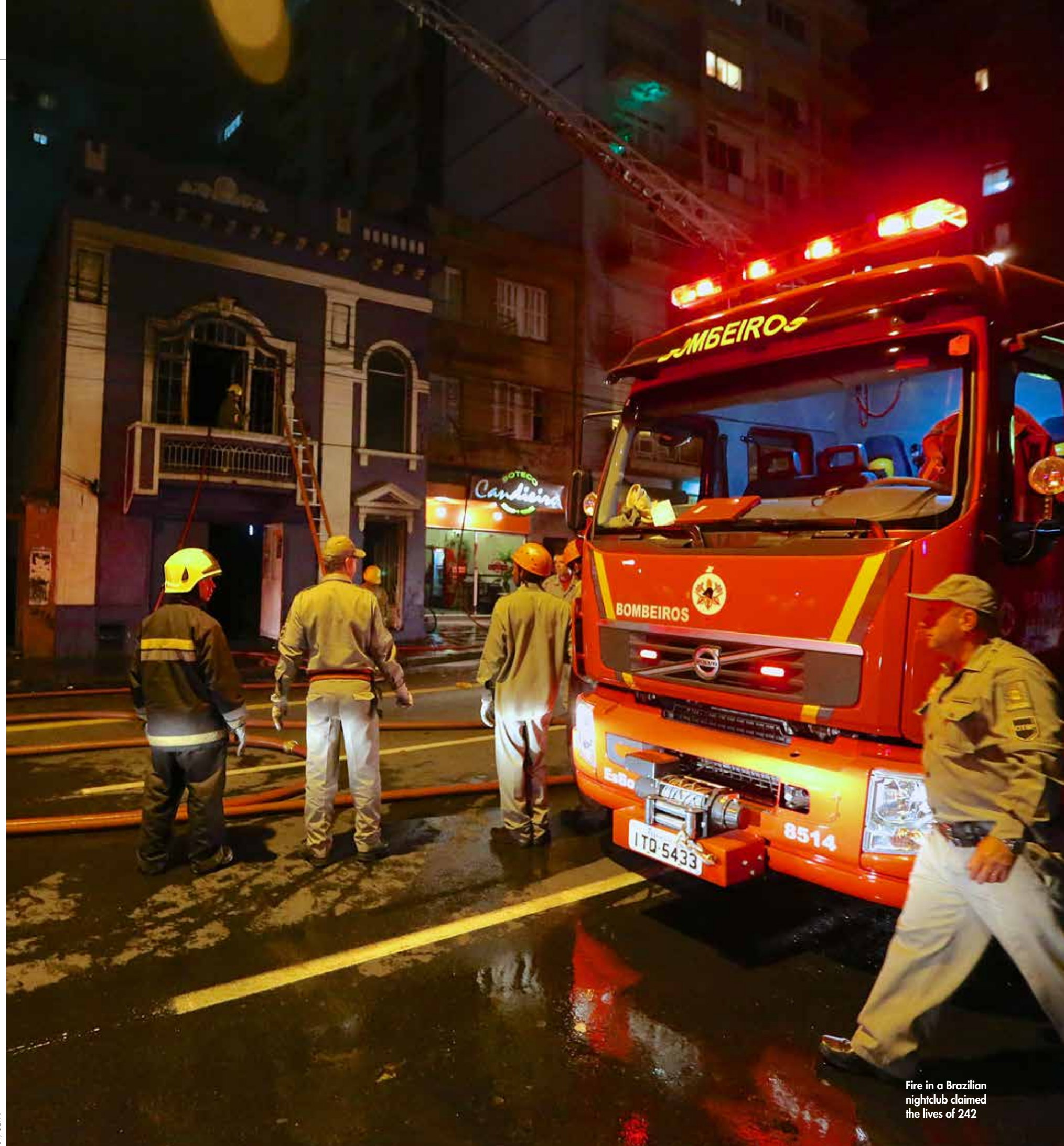
Albiac cites the example of the EU’s European Road Safety Action Programme that included the target of halving the number of road deaths by 2010 compared to 2001 levels.

“As a result of EU leadership and implementation at national level, the number of road deaths in the EU fell by 113 per million people to 69 per million. With Europe taking the lead we could also reduce the fire risk of our buildings across all member states.”



FIRE SAFETY YEAR

2014 was designated Fire Safety Year by the Knauf Group which manufactures a range of fire-resistant building solutions including Knauf Fireboard. Activities included taking part in a Trade Fair for Preventative Fire Protection in Germany, organising a technical programme and tour for German fire protection specialists at the company’s headquarters in Iphofen and distributors in Germany as well as launching an online fire safety information campaign at www.knauf.de/brandschutz



Fire in a Brazilian nightclub claimed the lives of 242

AFP/GETTY



A blaze in Qatar killed 19 including 13 children

THAT LACK OF consistency is reflected in the regulated height up to which combustible insulation materials are allowed on the facades of buildings in Europe. For instance, a school being constructed in the Czech Republic requires non-combustible insulation while the same building in the Netherlands has no requirement whatsoever regarding the insulation products used.

Then there is the danger of time. In the 1950s it would take around 25 minutes for a full blaze to take hold, allowing the rescue services time to respond and contain the fire, but now a big fire can be out of control in under five minutes, says

**MORE THAN
2
MILLION**
fires reported in
Europe every year

Juliette Albiac Managing Director of Fire Safe Europe.

“Policy makers and the public presume that buildings are safe, but there are still more than two million fires reported in Europe every year, 90% of which are in buildings and this is where we spend 90% of our time. When it comes to fire safety, failure should not be considered an option,” she said.

“That is why we are calling for an EU-wide action programme to ensure that harmonised rules are put in place to make sure that construction products and practices consistently meet appropriate, higher and more rigorously enforced fire safety standards.” ■

The critical importance of choosing the right insulation for the right construction job was underlined by dramatic fire tests carried out by international scientists and engineers in Croatia.

Three different applications of insulation were installed on the facades of three identical eight-metre-high test walls and set alight at the same time.

The wall fitted with EPS insulation pumped black toxic smoke into the air and completely burned out within 15 minutes and a wall covered with Rock Mineral Wool contained the fire and was structurally undamaged.

The third wall that was installed with EPS and a Rock Mineral Wool fire barrier above the source of the fire, delayed the spread of the fire

FIRE, SCIENCE & INSULATION



for 10 minutes. However, when the blaze ‘jumped’ this barrier the same toxic smoke and furious flames of the first wall occurred.

Barry Lynham, President of Fire Safe Europe and Group Director of Strategy and Communication at Knauf Insulation, said: “This test

highlights the importance of using the right products for the right building during construction or renovation.

“In tall buildings such as schools or hospitals where it is vital that people are evacuated quickly and safely you need the most fire resistant materials possible.

“As far as regulations are concerned we are at a tipping point across Europe and it is vital that we don’t allow these regulations to be less fire safe especially when it comes to public buildings.”

The fire tests were carried out by Zagreb University, the Croatian Association for Fire Protection and Fire Safe Europe – of which Knauf Insulation is a member – and were witnessed by over 200 construction experts from 27 countries.



‘A CATASTROPHE WAITING TO HAPPEN’

Mikael Svanberg has 25 years experience as a fire fighter. He is operating Fire Officer in the Greater Stockholm Fire Department in Sweden and the International Secretary of the European Fire Fighters Unions Alliance.

Why is your alliance calling for new EU-wide fire-safety regulation?

Fire safety regulations have not been changed on an EU-level for decades, but buildings and construction materials have changed dramatically in the past 30 years.

In what way?

More inflammable materials such as plastic material are being used today than in previous years. This means that a fire can take over an entire room within two to three

minutes compared to 15 to 20 minutes in the 1970s.

What is your experience of this?

We are seeing fires behave differently even compared to a few years ago as a result of these materials and the way buildings are constructed today. Taller constructions, lighter cheaper materials, more underground facilities and bigger internal open spaces have contributed to the speed at which fire and smoke moves through buildings compared to say, a traditional brick house.

Why has nothing been done to reduce this risk?

Fire safety is not cheap. Installing sprinklers, choosing more fire-safe construction materials or a separate lift for fire fighters in high-rise buildings, for example, is expensive.

But lives are at stake.

Of course. There is an extremely high risk of a fire catastrophe waiting to happen. In some countries fire regulations are strict in others they are not, we want to upgrade and harmonise

fire safety regulations across Europe.

What sort of safety inconsistencies have you seen?

The maximum distance from a fire exit set by individual member states varies from 30 to as far as 60 metres. Would you make it? Now imagine your children or your parents. Every European country takes the crime of arson seriously with jail sentences of up to 25 years or life, but the same level of seriousness is not being applied to building fire safety.

So what are the alliance’s aims?

We want to see the accurate collection of fire data and reliable classification of that data. There are said to be two million fires every year in Europe injuring 70,000 people. How serious are these fires? How serious are these injuries? We need a clear picture. We then need to introduce uniform regulations across Europe that tackle the issue of fire safety in buildings in a holistic way covering prevention, building materials and construction.



Saving energy in *practice*, NOT JUST IN THEORY

Knauf Insulation is aiming to help the building chain get the most out of the saving potential of insulation.

KNAUF INSULATION believes its role is not only to produce energy-saving products but also scientifically test how these products perform once they are installed.

As a result of years of intensive studies, the company is now at the cutting edge of research into building energy efficiency and insulation covering everything from assessment and installation to detailed monitoring and data analysis.

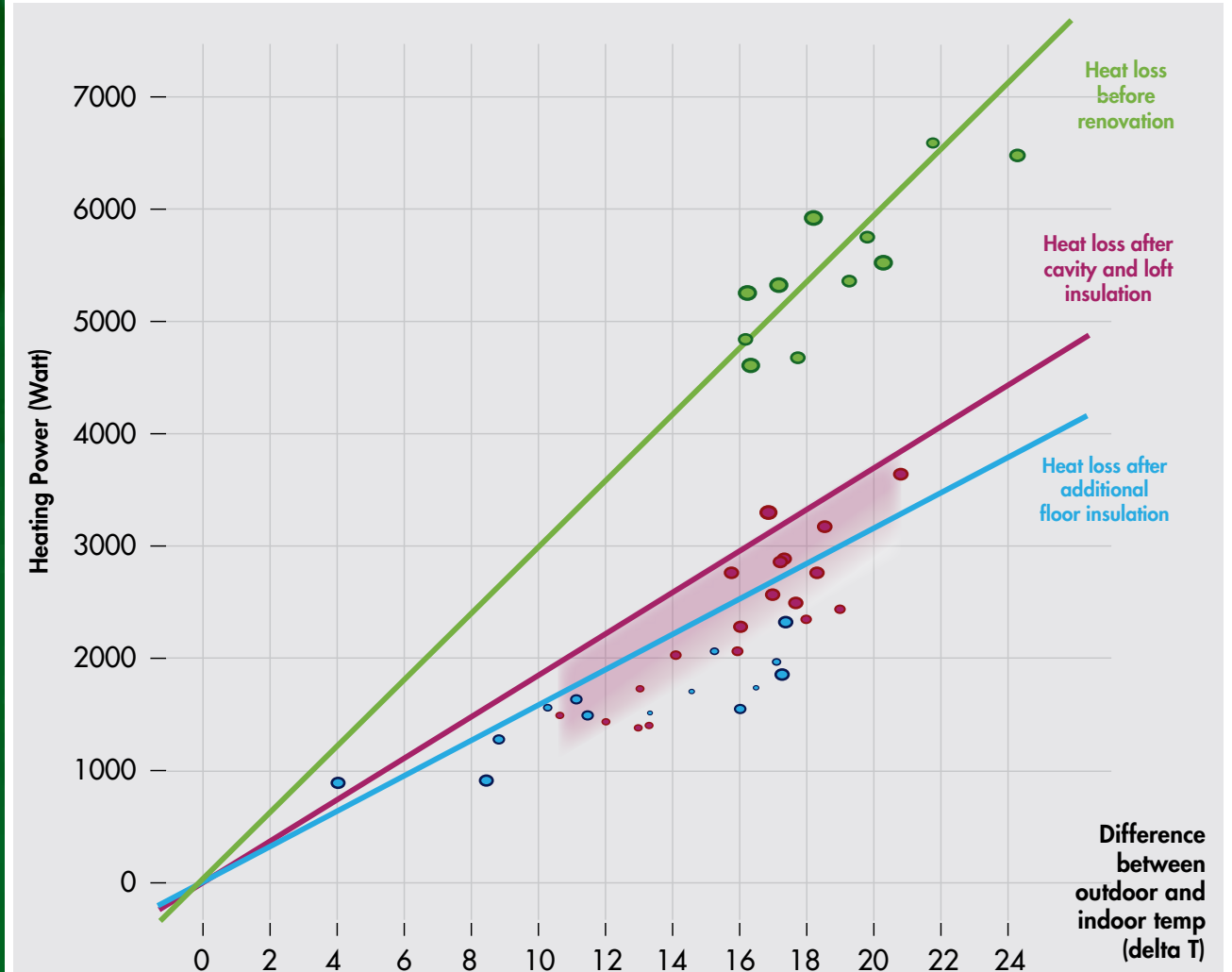
Recently, in collaboration with the University of Leuven in Belgium, as well as the Belgium Building Research Institute Knauf Insulation has been monitoring the impact on heat

loss, in an unoccupied Belgian home designated for social housing that was fitted with Knauf Insulation's SUPAFIL® Cavity Wall 034 and SUPAFIL Loft.

When it comes to the performance of products there can be no management without measurement. That is why this study – one of many we have carried out – was so important. Knauf Insulation's building physics team is examining the performance of the company's products in situ.

The main objective was to understand the performance after insulation has been installed not just the theory. We wanted to

50%
Simply insulating your home with cavity, loft and floor insulation has been proven to cut heat loss by up to half



SHOWING HOW MUCH ENERGY IS SAVED THROUGH VARIOUS DEGREES OF RENOVATION

This test house revealed a heat loss reduction of almost 50% through installing cavity, loft and floor insulation. Before insulation was installed the house lost 296.55 W/K (green line); after cavity and loft insulation was installed, that dropped significantly to 185.63W/K (red line) a saving of 37.4%. In a third step, the experiment measured the heat loss after floor insulation was also installed, and saw that an additional 27.79W/K, that's 9.3%, was saved (blue line).

Left to right, Geert Bauwens, PhD student KU Leuven, Professor Staf Roels, KU Leuven, Frederic Delcuve, Building Physicist at Knauf Insulation and Geoffrey Houbart, Innovation & Project Manager at Knauf Group

PICTURE: ©JONAS HAMERS/BELGAIMAGE

measure the effectiveness of products in situ, but importantly we wanted to understand the importance of installation and compare the data we collated with calculated performances using dedicated software.

The results

The expected values were in line with what was delivered by our insulation. As we tested the house at different stages of insulation – without, in the wall, the roof and the floor – we could also quantify the influence on heat losses at every stage. That's important because the owner of a house can then understand exactly the energy saving benefits at every stage. Without insulation, the heat loss from the test house was 296.55W/K but after the cavity wall and loft were insulated this dropped to 185.63W/K and after the floor was insulated the heat loss dropped in total to almost 50% to 157.84W/K (see graph).

Learnings

Insulation does perform as expected when it's installed correctly and this underlines the importance of good installation practices to ensure optimal performance. The test also highlighted the importance of paying close attention to

'constructive details' of those areas, for instance, where walls connect to floors or ceilings. This is where good training is important.

Impact of occupant behaviour

A building can be well insulated but the people inside might not be managing it well. For example, there might be a 'rebound effect' where because a house is well insulated people think they can heat it up more. So education is important. We need to understand our energy use at home by monitoring our thermostats and energy bills. But, the most important message of all is if we improve the fabric of our buildings we improve our comfort and ultimately reduce energy consumption.

Future developments

It would be interesting to see a form of certification that could be awarded to companies on the basis of on site diagnostic testing carried out in their houses. Both the social housing sector and private sector are interested in seeing that heat loss values are also the real values of insulation. We also need to do wide-scale testing. And then more advanced testing for different types of buildings that exist.

How industry loses billions every year

European profits are going up in smoke as a result of industry's failure to insulate.



NEW RESEARCH into wasted energy in Poland, Spain, Germany, France, Italy, Sweden and the UK by the European Industrial Insulation Foundation (EIIF) reveals that industry is seriously underestimating the savings potential of insulation and overestimating the pay-back time of its implementation.

For example, the research shows that in Germany, an initial countrywide investment of €180 million into industrial insulation would pay back in less than a year saving German industry €750 million annually (see graph for other countries).

“Many big power plant owners are looking closely at every detail of their processes for ways to save money such as the performance of their equipment but completely ignoring poorly maintained insulation or areas of their plant that

lack insulation completely,” says Gregoire Morel, Knauf Insulation’s General Manager of Technical Solutions.

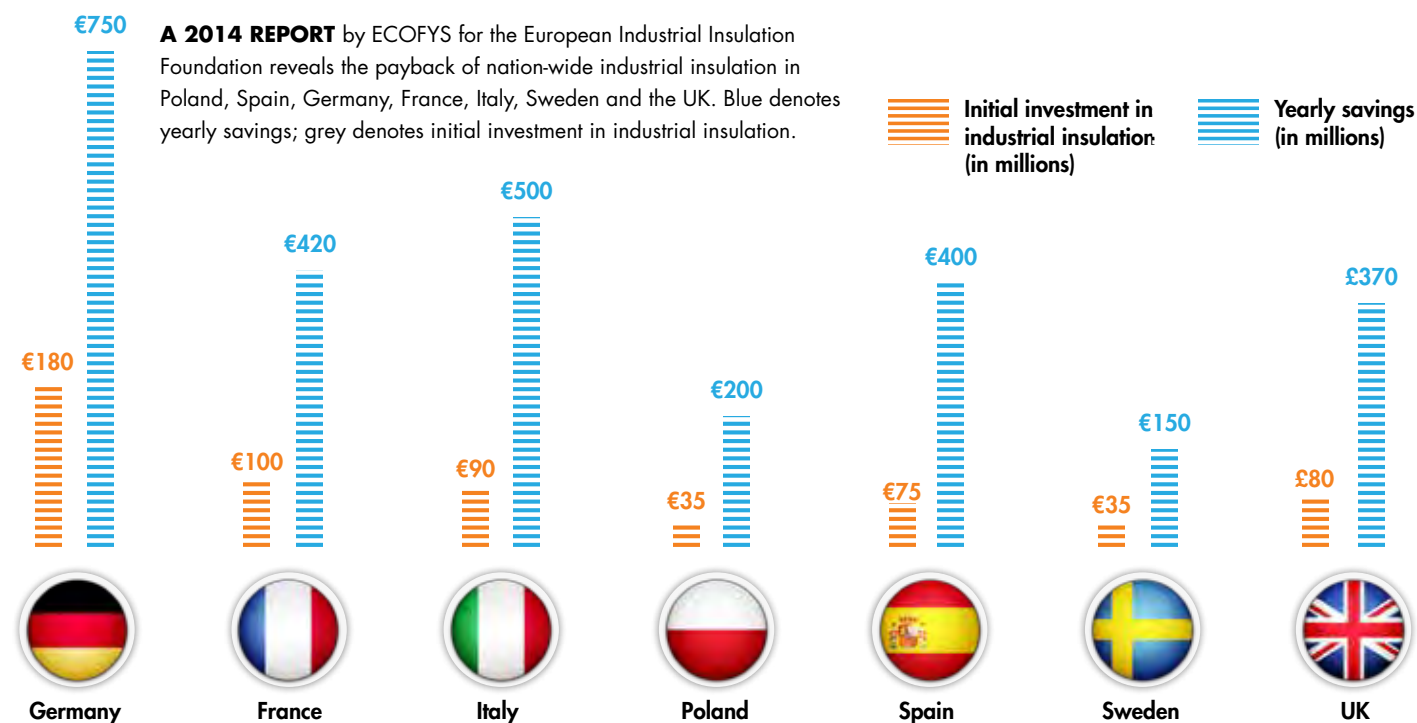
For example, there is often extreme heat loss from connecting process pipes, says Morel.

“Another factor is that 10 to 15 years ago energy was cheaper and environmental awareness was not a priority. Today the climate is on all political agendas and energy is much more expensive. Industry is now losing billions by failing to insulate.”

Knauf Insulation’s Technical Solutions offers industry cost-effective sustainable solutions for saving energy by providing products that combine low thermal conductivity with excellent ease of installation and fire safety. The division also supplies insulation solutions for heating, ventilation and air-conditioning systems for non-residential buildings such as airports, schools or distribution centres.

€750 million
Could be saved by German industry every year after a one-off payment of €180 million on insulation

MONEY TO BURN



‘Outstanding’ SUCCESS



A DUTCH DISTRIBUTION centre featuring Knauf Insulation products has been awarded the highest ever BREEAM score in the Netherlands.

The new Logic II centre built by logistics company Dok Vast in Tilburg received ‘Outstanding’ certification with the highest score of 91.17% out of the 284 BREEAM certified projects in the Netherlands.

Knauf Insulation’s Dutch distribution partner HANKO Handelmaatschappij BV supplied the heating, ventilation and air-conditioning (HVAC) insulation for the centre.

“Knauf Insulation helped us a lot with documents like the declarations of performance, CE and non-asbestos certifications which were important to win the deal,” said Hans van Gastel, HANKO’s Insulation Manager.

Meanwhile, HANKO supplied 22,000 metres of piping insulation from Knauf Insulation to Schiphol International

91.17%
The record BREEAM score of this new Dok Vast building

Airport in Amsterdam. The part-renovation project involved the refurbishment of an existing 43,000m² business zone of the airport, known as The Base, which includes offices, restaurants and shops.

Knauf Insulation products were chosen because they met demanding BREEAM certification standards.

ANOTHER KEY Dutch project in 2014 was the installation of Knauf Insulation products in the LEED Platinum-rated Fugro Technocenter. Offering warehouses, workshops, laboratories and offices all fitted out to the highest sustainable standards, Knauf Insulation provided thermal insulation piping from its HPS 035 AluR pipe range.

Sustainability has become a key driver of construction in the Netherlands. By 2020, for example, all new buildings must be energy neutral.

EXCELLENCE GUARANTEED

KNAUF AND Knauf Insulation have launched a new programme in the Netherlands called KnaufZeker® which guarantees system performance excellence.

Every Knauf product listed on www.knaufzeker.nl has been independently

tested to guarantee its performance is of the highest standard whether it’s installed individually or as part of a combined system. Via the site’s prestatiewijzer (performance indicator) it’s easy to search for products that are covered by a KnaufZeker warranty and

view their guaranteed performance. Installers can also print out a KnaufZeker performance guarantee certificate for principals. For major projects such as hospitals, theatres and schools, there is KnaufZeker uitgebreid (extensive) where we provide training

on-site or at the Knauf Academy as well as support such as site-inspections and detailed construction drawings. Major projects already built with the KnaufZeker guarantee include the dramatic cube-shaped new Hilton Hotel at Schiphol Airport.

Knauf Insulation has the solutions to keep the heat inside ovens as well as buildings



Hot favourite

Knauf Insulation is enjoying major growth in the oven insulation business.

“WE HAVE very high goals – we want to become number one globally, not only in insulation solutions for ovens, but also for domestic appliances as a whole,” says Uroš Cotelj of Knauf Insulation’s Original Equipment Manufacturing (OEM).

“We will achieve this with our advanced insulation solutions which are fully compliant with the most demanding European standards.

“In 2008, only a minor part of insulation solutions for ovens, manufactured in Europe were provided by us, but by 2014 we were on track to provide insulation to a more significant part of the market.”

And that’s a lot of saved energy. And a lot of saved CO₂.

Due to demanding European

energy standards, oven producers, like many other domestic appliance manufacturers, now require high levels of energy efficiency for their appliances.

And Knauf Insulation’s OEM team with its own laboratory at Škofja Loka in Slovenia is increasingly being recognised as a strategic development partner even in the early planning stage of new appliances.

“When their basic prototypal device is developed, on the basis of our expertise, experience and extensive measurements of energy efficiency of newly developed ovens, the best possible insulation solution is found,” says Cotelj.

For example, the upmarket Swedish kitchen brand ASKO, recently placed an order for OEM insulation solutions for 55,000 of

its ovens. After comprehensive measurements in Knauf Insulation’s laboratories the newly-designed and tailor-made OEM insulation solution saves 12% more energy than the previously used insulation and places the ovens in a high-energy efficiency class.

Annually, that’s an average saving of 14.8 kg of CO₂ per oven or 814 tonnes of CO₂ for the entire order.

Imagine the reduced environmental impact from all the European ovens we insulate every year...

“We are further extending our laboratory while new testing

55,000
The number of ASKO ovens to feature OEM insulation solutions

and measurement equipment acquired last year helps us find and indicate any and every deviation such as energy leakage or non-efficient use which finally helps us determine what kind of product is needed,” says Cotelj.

“New markets are actively seeking us out for our energy-saving solutions and we will continue to build on our success.”

Of course oven manufacturers are just one industry that calls on OEM for insulation design expertise. Others include manufacturers of prefabricated building elements, doors, road sound barriers, industrial appliances and more.

Within each industry OEM provides customised solutions. For sandwich panel manufacturers, OEM provides high-performing insulation materials that among others represent the most cost-effective solution in the global effort to save energy, while for road barriers the division offers bespoke solutions designed to meet specific noise-insulation requirements.

IMAGE SOURCE: ASKO

DESERT INSPIRATION

SITUATED ALONG Highway 40 in the heart of the desert landscape of Kuwait something extraordinary is happening.

After hours of unremitting desert sandy views, there is a brief respite in the form of a handful of lush green fields.

These are the test fields of Knauf Insulation’s Urbanscape where verdant greenery grows on top of harsh desert sand and where the landscape can bake in summer temperatures of over 50°C.

“We were carrying out the tests to demonstrate to potential clients exactly how resilient Urbanscape can be in the Middle East and the results have

Knauf Insulation’s Urbanscape® is transforming desert landscapes.

been extremely encouraging. We are now discussing plans for extensive use throughout Kuwait,” says Jure Šumi, Knauf Insulation’s Business Development Director Green Solutions.

In other Middle Eastern Urbanscape pilots, 270 tree are being grown in desert greenhouses and 27 trees are flourishing in a barren desert

space being planted as part of a unique ‘forestation project’.

So why is the product so successful?

Urbanscape products are made from natural Mineral Rock Wool fibre and can hold as much as 122% more water than sites without the material, says Šumi.

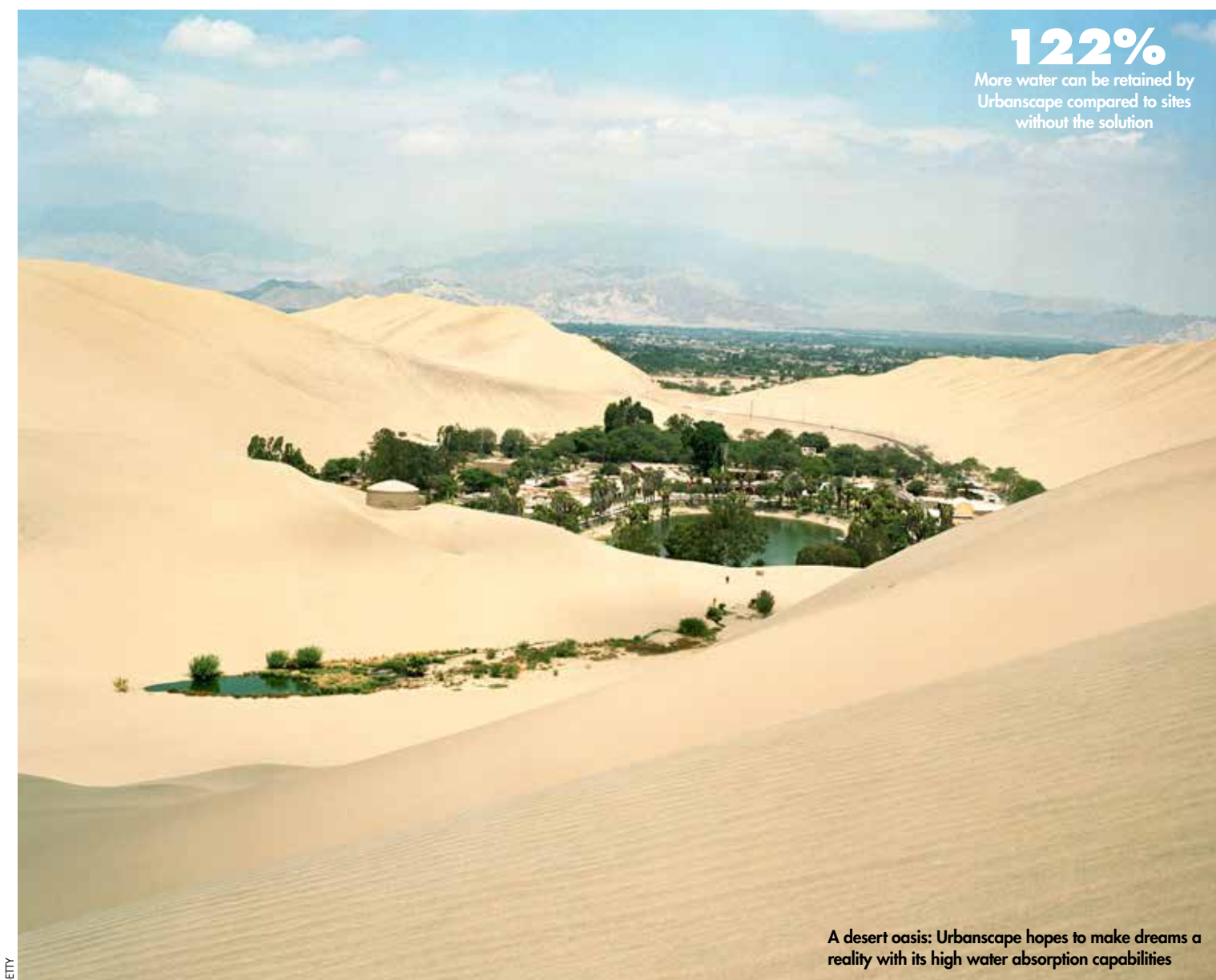
All Urbanscape products absorb and store water when it is available and release it when

there is not enough, which makes it ideal for challenging environments such as deserts.

“There are ambitious plans in some parts of the Middle East to create green areas in the desert but clearly there are considerable practical issues such as intense heat and water sources to consider,” says Šumi.

“However, we are delighted that Urbanscape is proving to be a valuable support system in the realisation of these dreams.”

Urbanscape’s versatility has now extended into other areas where applications have included the greening of golf courses and extensive agricultural use.



122%
More water can be retained by Urbanscape compared to sites without the solution

A desert oasis: Urbanscape hopes to make dreams a reality with its high water absorption capabilities

GETTY

CULTURAL (r)evolution

Changing behaviour is critical to the creation of a safer workplace at Knauf Insulation. And everyone has a role to play.

A STAGGERING 85% of workplace accidents are triggered by unsafe behaviour.

It's a statistic that cuts to the heart of Knauf Insulation's approach to health and safety – if people learn to take responsibility for their own safety and the safety of their colleagues there will be fewer accidents.

That's why the company's Health, Safety and Environment (HSE) department is rolling out a strategy that ensures a pro-active approach to changing behaviour by anticipating accidents before they happen.

In 2013 Knauf Insulation saw an increase in lost time accidents (LTAs) from 10.13 in 2012 to 15.15 in 2013. In previous years there had been around 10 per year (see graph).

"Whilst this sharp increase partly relates to better reporting and better data quality, it remains unacceptable and that is why we immediately implemented a new strategy in 2013," says Jef Snackaert, Knauf Insulation's Director of Health, Safety and Environment. "We are now seeing that strategy paying dividends. By August 2014 LTAs were down to 7.4."

So how is this being achieved?

"The role of HSE is not to police procedures but to ensure each and every team member shoulders responsibility for health and safety and is held accountable," says Snackaert.

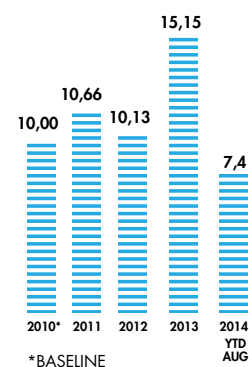
"Any improvement process consists of three elements: first to understand where you are; secondly agree on where you want to be and thirdly, define what is needed to get there," says Hans Vanhorebeek, Group HSE Manager, Training and Behaviour.

"In our case the first element is to measure the current safety culture at Knauf Insulation.

"Where we want to be – our ultimate goal of zero harm – will be translated in the Expectations, Roles and Responsibilities for every single employee within Knauf Insulation.

"Based on the Safety Culture Assessment we will then develop with each stakeholder tailor-made action plans to achieve that ultimate goal."

Underpinning this approach is the establishment of clear expectations so everyone understands what is required of them when it comes to health and safety. This may mean a zero tolerance attitude towards deliberately violating critical safety rules, or the strengthening of operational rules and regulations that enhance safety.



LOST TIME ACCIDENTS

A new strategy was implemented following the rise in 2013 and is already showing positive results.

A top-down approach is also vital; HSE workshop training for senior management was designed so that they can lead by example.

"It is important that the leadership is consistent, never turns a blind eye to HSE and has the tools to have proactive constructive conversations," says Vanhorebeek.

What are these tools?

THROUGHOUT 2014, Knauf Insulation Board members will be going through the Safety Cultural Maturity workshop, followed by a plant being part of a pilot. In parallel, key people will be identified and trained to become the company's internal workshop leaders for safety culture maturity. This approach will allow us to have all our facilities assessed by the end of 2015 at the latest.

Communication on HSE is also being taken to the factory floor. Short 15-minute discussions known as 'toolboxes' involving not more than a handful of people are being

introduced to focus on specific HSE issues in different areas of plants.

Online 'HSE Alerts' have been introduced that examine the causes of individual incidents at plants, the key lessons to be learned and the actions that every plant should take to avoid similar situations occurring at their site.

Reinforcing best practice are 'Hi-Plus Announcements' that share success stories throughout Knauf Insulation by highlighting the elements that contributed to a particularly striking HSE achievement and what others can take away from this achievement.

"Health and safety at Knauf Insulation is not rocket science," says Snackaert. "We need to enable leadership at all levels in the organisation to go out on the shop floor and engage in HSE discussions, everybody needs to know what is expected of them and we need to constantly nurture the conversations that will change behaviour. Better planning and preparation means fewer incidents. It's as simple as that."

RECORD TIMES WITHOUT LOST TIME ACCIDENTS

By September 3, 2014, Visé had logged 325 days without a lost time accident (LTA), a record period for the plant that employs 200 people in Belgium.

Meanwhile at Shasta Lake in North America, another LTA record has been broken. By the same date an impressive 603 LTA-free days had been reported.

So what drove such a sustained period of success?

Both plants reported improved analysis of all incidents, better communication, fast constructive feedback and a strong top-down approach from management.

"We keep safety at the forefront of everyone's mind by involving most members of staff in hazard identification by engaging them in the plant inspection process each month," says Shasta Lake's HSE manager Randall Peterson. "We also meet daily to assess, prioritise and develop action plans for the mitigation of newly

reported safety issues.

"It's also important to always provide feedback to an individual when observing their work practices, whether unsafe or safe, because in the space of a short conversation you can quickly establish safer – ultimately better – ways of doing things, or for that matter reinforce what they have just done safely," Peterson says.

"From 2011 to 2013 we were experiencing an LTA about once a month at Visé and this was perceived as 'normal'," says Bertrand Kevelaer, the site's Health, Safety and Environment Manager. "Now our culture has changed and no accidents are the new 'normal'."

And of course, preventing the danger of complacency is critical. "You may have been driving a car for 10 years without an accident, but tomorrow that may change. It's the same in the plant, it's important to always anticipate any accident possibility," says Kevelaer.



Spotlight on ST HELENS

Continuous Improvement integrated health and safety into every aspect of the plant. Now it's 'just the way we do things' round here'.

The challenge

Traditionally in manufacturing, health and safety was often seen as a chore – just another task on top of an already intense schedule. The result? It was hard to motivate people about health and safety.

What happened at St Helens?

At St Helens health and safety has become ingrained in day-to-day life. Today there are no health and safety inspections – only manufacturing audits that integrate safety at every level. “It is just part of the way we do things ‘round here,” says Kevin West, Health and Safety Manager.

So what changed?

This journey of Continuous Improvement or CI began four years ago with external consultancy support, which led to the creation of the roles of full-time CI manager and CI Practitioner who report to the Plant Manager. In turn a CI plan was integrated across all plant functions. To date 93% of the workforce has completed CI training.

93%
of the workforce has completed CI training at St Helens.

And what happened next?

Now all resources are focused on achieving a vision. This vision was defined as achieving targets for Overall Equipment Effectiveness (OEE) for production equipment; on-time in full delivery performance; monthly targets for manufacturing costs; and health, safety and environment. Driving this vision are the Knauf Family Values of Menschlichkeit, Partnership, Entrepreneurship and Commitment. St Helens tries to de-silo functions, to encourage partnership, utilise employee ideas, encourage entrepreneurship and ensure continued engagement and empowerment.

What does this mean in practice?

Continuous Improvement workshops were introduced lasting up to 10 days to cover critical aspects such as organising a productive workspace (a productive workspace is safer); reviewing the state of equipment, ensuring everyone understands how it functions (with straightforward one page explanations); problem solving exercises and management presentation training to help operators achieve their plans.

What else?

There are eight Knauf Family Values Ambassadors at St Helens who work on projects set by employees covering aspects such as new employee inductions, hazard spotting, training and social activities. They meet regularly with management and union representatives.

How are new ideas introduced?

Anyone can submit an idea for improvement – including safety – to a scheme run by the Engineering Project Manager and Area Process Leaders. An idea is reviewed by the team and a decision made on whether to progress or not. Ideas are physically placed on notice boards that also communicate updates on Continuous Improvement projects, safety and general information.

And how is momentum maintained?

There are daily meetings that focus on the plant's vision where all aspects of performance are reviewed and any violations – such as safety for example – are considered and countermeasures put in place to ensure improvement.

Ian Gornall, Plant Manager at St Helens, takes the team through a daily meeting

Plant performance for the previous 24 hours is also reviewed together with a plan for the next 24 hours. Every week Process Leaders complete a Level 1 Process Audit to ensure systems are maintained and every month a Level 2 Audit is carried out by members of the Management Team to allow one-to-one discussion with process operators about concerns.

So what do people think about Continuous Improvement?

Mark Daly works as a Senior Process Operator in the Multi Pack System Area and has suggested several Improvement Ideas. “Guys are full of ideas,” he says. “Continuous Improvement is an opportunity to get new ideas heard, to beat routine, you can progress quicker get up to speed. Do we feel safe working at Knauf Insulation? Previously we just copied what other people did. But through integrated safety there is more understanding. It's a safe place here.” As Phil Kerfoot, CI Manager, sums it up, “We're on a journey of Continuous Improvement. It never feels like it's finished you can always see the next opportunity.”

Talent FOR THE future

A sustainable workforce is critical to the growing success of Knauf Insulation.

A FOCUS ON PEOPLE is a vital part of Knauf Insulation's DNA. And it is a focus that has become sharper over the past two years with the company introducing a 'sustainable people strategy' with a long-term perspective and inclusive approach.

There are two key aims. The first and most important is to create a sustainable workforce by respecting employees' needs and company values while achieving business challenges. It starts with allowing each employee to realise their potential.

The second is to identify the organisation's future leaders and help them grow their impact while ensuring they are ready for their next business challenge.

TALENT ACQUISITION

"We believe it's vital that we attract people who will join our effort to shape our future," says Julien Guerrier, Human Resources Talent Acquisition Manager. "Several task forces are now in place to improve our recruitment methods and our employer branding.

"One goal, for example, is to hone our managers' interviewing skills to consolidate their ability to choose candidates who fit our values and have the desire to learn from customers, consumers and colleagues as well as the ability to create competitive advantage with an entrepreneurial mind-set to seize opportunities in changing markets."

TALENT DEVELOPMENT

Talent development is a cornerstone of Knauf Insulation's people sustainability programme. By enhancing Partnership and easing the mobility of talents it provides broader career opportunities for everyone within the entire Knauf Insulation Corporation. 'Building oneself and the organisation' – a Knauf Insulation competence discussed during performance review – is a vital component for a leader: providing authentic feedback to the team, identifying and nurturing talent that can be promoted to a key position.

1. 360° PROGRAMME

The 360° programme helps the talent development process by collecting feedback from a full range of perspectives so that everyone becomes aware of their behavioural traits and impact on others. Many management teams have already taken part in the 360° programme and it will continue throughout 2015.

2. DEVELOPMENT CENTRES

Development centres have been created to provide deep-dive self-examination by offering a safe, appropriate environment in which to discuss an employee's career. "The development centres are based on the belief that everyone is accountable for their own career management and professional development," says Virginie Limbourg, Human Resources Talent & Development Manager.

"With the support of line management and human resources the individual chooses the way they drive their personal development and at what speed."

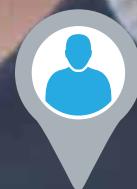
3. PEOPLE DEVELOPMENT AND TALENT REVIEW

Line managers and human resource departments are now engaged in a new type of review dialogue. The review starts with discussing everyone's development on the job and the potential beyond current role.

"The people review is more than workforce and succession planning," says Virginie Limbourg. "We identify talents but instead of developing one person for a specific job, the focus is on developing key people to gain the agility of an effective leader and entrepreneur."

SUSTAINABILITY AT EVERY LEVEL

Through these programmes, Knauf Insulation aims to support and foster a sustainable people strategy at every level of the organisation. Knauf Insulation strongly believes that its highly energised, enabled and engaged teams will efficiently face the future challenges of the insulation market. ■



Development centres are based on the belief that everyone is accountable for their professional development



The 360° programme helps development by collecting feedback from a full range of perspectives

Life LESSONS

We've been around since 2002. Since then, we've built some plants and acquired others, meaning some of our employees have been around longer than we have. There's a lot to learn from experience.



REGION: RUSSIA & CIS

Name: ANDREY VEKSHIN
Location: TYUMEN, RUSSIA
Occupation: MPS OPERATOR
Start date: NOVEMBER 1, 1996
Years: 18

Why have you stayed with the company for so long?

I like continuity. When I came to the plant when I was young, I decided that I would work here all my life until retirement.

What makes the company so special?

In our climate, the production of insulation is highly important. A house can't be built here without it.

What has been a highlight of your career?

A major highlight was the transition from the administrative staff to the production line.

What's the biggest change you have seen in your time at Knauf Insulation?

The walls are the same but the production equipment has changed and new technologies have been introduced.

What advice would you give to someone starting a career at Knauf Insulation?

Love your job.



REGION: CENTRAL EUROPE

Name: LUDWIG SCHAEFFER
Location: SIMBACH, GERMANY
Occupation: PLANT MANAGER
Start date: JULY 1, 1971
Years: 48

Why have you stayed with the company for so long?

The company has always created products for the benefit of customers and this has been the case since the Simbach site was established 87 years ago. Throughout these years the company has had to constantly adapt to market conditions and this has always led to interesting situations.

What makes the company so special in your opinion?

The invention of wood wool board; the reputation of Knauf Insulation and the positive working atmosphere at the Simbach site.

What has been a major highlight in your career?

There have been many highlights. Very little had changed in the technical areas until a management buy-out in 1970. Then we saw the

upgrading of technology from hot hardening to cold hardening systems, which completely changed production; the introduction of the auto-mix litter system for Wood Mineral Wool and the introduction of system-oriented management.

What's the biggest change you have seen during your time at Knauf Insulation?

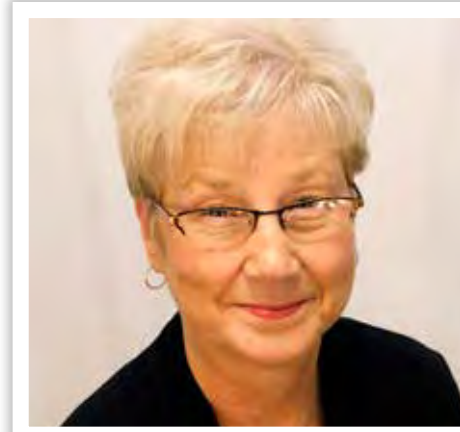
The time with Knauf Insulation was affected by important and forward-looking capital expenditures, such as a new finishing line in Simbach.

What advice would you give to someone starting a career at Knauf Insulation?

Knauf Insulation [which acquired Simbach in 2006] is a prosperous company that has an outstanding approach to acquisitions bringing the fiscal reserve and drive that keeps a secure future in mind. Additionally, the sales and marketing activities are great!

What advice would you give to someone starting a career at Knauf Insulation?

Find out exactly which tasks, areas of competence and responsibility are expected in the envisaged position.



REGION: NORTHAMERICA

Name: BONNIE COLE
Location: SHELBYVILLE, US
Occupation: CREDIT ANALYST
Start date: DECEMBER 1, 1969
Years: 45

Why have you stayed for so long?

Knauf Insulation has always seemed like a second family to me. The employees are historically an important asset to the Knauf family and that feeling carried over into everyday life on the job. I lived in Shelbyville and it was important to be in town when my children were small and in school. Forty-five years seems like a very long time, but those years went very quickly. I've always enjoyed working at Knauf Insulation and never really thought about leaving.

What makes the company so special?

The employees in Shelbyville were all working towards the same goal of making a superior product and giving customers the best service

Bonnie Cole: 'When I started the computer was a dream and accounting was with a calculator and 13-column tablet'



REGION: WESTERN EUROPE

Name: AD HEIL
Location: OOSTERHOUT, NETHERLANDS
Occupation: PROCESS OPERATOR
Start date: MAY 23, 1977
Years: 37

we could. We spent many years perfecting this service package and we are very proud. Our long time customers are also part of that family feeling.

What has been a major highlight?

In 1985 I was given the opportunity to transition into the Credit Analyst position. The old saying is: "You never choose to be in credit, you just land there and never get out." I have enjoyed the relationships made with the external customers, the sales force and other credit professionals in the industry. The Credit Department touches almost every department within the organisation. It has been a very rewarding career. I was also able to complete my college education in 1990 with the help of Knauf Insulation. Knauf Insulation is very instrumental in helping employees further their education.

What's the biggest change you have seen?

Technology. When I started at Knauf Insulation, all telephone calls flowed through a PBX switchboard, were answered by the operator and directed manually. The computer was only a dream and accounting functions were all done by hand with a calculator and a 13-column tablet. Today, everyone wants to get rid of paper and access everything on an electronic device. Life is very 'in the moment' in today's business world.

What advice would you give to someone starting a career at Knauf Insulation?

My advice would be to be flexible and embrace change because there are constant changes within the organisation today. We are growing and there can be a few growing pains.

Why have you stayed with the company for so long?

Variety in the work. Work is close to home

What makes the company so special in your opinion?

My colleagues. They are open and friendly.

What has been a major highlight of your career?

It was a great honour to be responsible for taking care of product samples for customers.

What's the biggest change you've seen in your time at Knauf Insulation?

The arrival of new machines. They have made manual work more and more a thing of the past.

What advice would you give to someone starting a career at Knauf Insulation?

Listen and collaborate with your colleagues.



REGION: NORTHERN EUROPE

Name: MICHAEL PARKER
Location: CWMBRAN, UK
Occupation: ENGINEER
Start date: AUGUST 8, 1966
Years: 48

Why have you stayed with the company for so long?

I've had no reason to leave, I've enjoyed a good living, had a lot of different jobs and everyone at the company has been fair to me. The atmosphere and the people are great. It's like a big family. In fact there are quite a few close family members there. My son Lee also works at Cwmbran.

What makes the company so special in your opinion?

Knauf Insulation treats people well and it is always trying to improve its products.

What has been a major highlight in your career?

I had my first child when Knauf Insulation bought the old glassworks in 1976. There was considerable investment in the plant and technology. Jobs were protected and created, which is very important in this area. I hope the plant continues to be successful for the next 48 years and Knauf Insulation continues to keep investing in the people here. Professional highlights? The fact I've enjoyed so many different jobs from being a store controller to engineering positions.

What's the biggest change you have seen during your time at Knauf Insulation?

Technology. Everything is faster today and everything is on a global scale. Technology has led to expansion, new product lines and that's been important for the creation of new jobs.

What advice would you give to someone starting a career at Knauf Insulation?

Do your best and think of the opportunities available. Through Knauf Insulation there are opportunities all over the world.



What has working for Knauf Insulation meant to you?

I've worked here for 43 years and started at a very young age. I had many posts, from labourer to forklift driver and quality inspector all the way to portal crane operator, which is what I do today. When I started at the company I was 17 and it has been some time. You could say I spent my whole life here. I've probably stayed here for so long because I have always felt at home. Knauf Insulation has been offering job stability and security to many people of Nová Baňa and the surrounding region for many years and is one of the largest companies here. These are probably my most important reasons.

How is Knauf Insulation different from other companies?

Knauf Insulation is a family company. That is true of both its owners and employees. Whole families – fathers, sons, cousins – used to work and still work at our factory. My husband worked at Knauf. He retired in February 2014, after working 44 years for the company. I would say that this family environment is what makes Knauf Insulation special compared to other companies.

What was the most important moment of your career?

There have been many moments like that during my time with Knauf but perhaps the biggest one came when you asked me to do this interview (smile). I was pleasantly surprised when I realised that I would be in the sustainability report. In terms of my work it means a lot for me that I stayed with Knauf for so long. In all my time with the company there have been many reorganisations. The company used to employ more than

REGION: EASTERN EUROPE

Name: BOŽENA ŠUHAJDOVÁ
Location: NOVÁ BAŇA, SLOVAKIA
Occupation: PORTAL CRANE OPERATOR
Start date: MARCH 17, 1971
Years: 43

a thousand people, while there are 280 today – and I'm one of them. For me that was a confirmation that I do my job well and that I'm useful to the company.

What is the biggest change you've seen happen at Knauf Insulation?

I started working for Knauf Insulation in 1971. Since then the company went through many changes. There were changes in the management, product range, internal organisation, and many other things. I'd say one of the biggest was the change from the old Izomat a.s. to Knauf Insulation in 2006. There is greater cleanliness of work areas, stricter rules of labour safety and better care for employees.

What advice would you give to someone who was just starting to work at Knauf Insulation?

This is a very relevant question for me at the moment. I am providing orientation to a new colleague who will take over as Portal Crane Operator from me. Anyone who starts in a new job should mainly pay attention and concentrate while learning about work activities. I'd also advise them not to be afraid to ask questions about how things work. It's better to ask twice than do a mistake later. And finally, make the most of your induction training. After 43 years I can say that I liked working here and I have been a proud employee of this company.

Božena Šuhajdová retired from Knauf Insulation in June 2014

SAVE MONEY, save energy



with **KNAUF INSULATION**
EXPERT

What you need to know about the benefits of insulation:

- Without adequate insulation, up to a third of energy used for heating and cooling homes could be wasted.
- Insulation is one of the most effective way of reducing energy bills.
- Properly installed insulation reduces heat transfer - so the home stays cool in summer and warmer in winter.



INSULATE LIKE A PRO

Community NEWS



Gold honour in Energy Olympics

KNAUF INSULATION helped a team of 30 Australian students win gold in the Solar Decathlon China – the largest sustainable building research and innovation competition in the world – better known as the Energy Olympics.

Knauf Insulation donated 451m² of Earthwool® insulation to the students from the University of Wollongong and TAFE Illawara institute who retrofitted a 1960s house to create a net-zero energy rated home.

The 'Illawarra Flame fibro house' beat 19 other entries from around the world after achieving 957.6 points out of a possible 1,000. The house had been first retrofitted on site using Earthwool® in ceilings and floors before it was disassembled and shipped to China for the competition.



KIND DONATIONS

Money and materials from the Knauf Insulation Natural Disaster fund (KIND) were donated to those devastated by flooding in Serbia in May 2014. Among the recipients were the Red Cross in Serbia and the Veseljko kindergarten for 250 children in the flood-damaged area of Obrenovac where Knauf Insulation donated insulation for walls and floors.



LANDMARK BIRTHDAYS

Some of Knauf Insulation's manufacturing facilities are celebrating landmark birthdays this year. In 2014 Knauf Insulation employees celebrated the 35th anniversary of the Glass Mineral Wool plant in Visé, Belgium (pictured above) and the 40th birthday of our Rock Mineral Wool plant in Surduljica, Serbia. Some of the newer manufacturing facilities are also celebrating landmark birthdays with Tyumen in Russia celebrating 10 years since it started operations (right).



PRESIDENT TOLD IT'S TIME TO SAVE ENERGY

Almost 80% of buildings in the Republic of Croatia are not properly insulated or even insulated at all. As a result many people are living in fuel poverty. Now more than ever it's time to save energy.

That was the message from Kresimir Benjak of Knauf Insulation in Croatia during

a meeting with the country's President Ivo Josipović at a reception organised by the Croatian Alliance for Energy.

"If the Croatian Government seeks the quickest way to strengthen the country economically, then that is surely through energy efficiency," said Benjak.



Setting the pace

KNAUF INSULATION colleagues from Australia and Belgium have been putting their best feet forward.

In Brisbane, an Australian team of runners (pictured right) took part in the March Twilight Running Festival and the ANZAC Day Run covering distances of between 5km and 12 km. Meanwhile, colleagues from Mont-Saint-Guibert and Visé in Belgium (pictured above) raced into action at the Brussels 20k in May.



CHAMPIONING CHARITY

In the UK Knauf Insulation's Christmas Jumper Day raised £250 for the CRASH charity, a construction industry initiative set up to help the homeless. Meanwhile, at the company's Belgian headquarters, colleagues collected two vanloads of donations including food and clothes for Les Restos du Coeur Local a charity that supports families in difficulty.



PROTECTING BIODIVERSITY

Knauf Gips KG has joined the organisation Biodiversity in Good Company.

The organisation was set up in 2008 by the German Environment Ministry with the aim of encouraging businesses to support biological diversity and has been financed by members since 2011.

Knauf has always had a policy of re-naturalising quarries and mines after it has extracted materials. Prof Matthias Reimann, Head of Commodity Hedging and Environment at Knauf in Iphofen said: "We look forward to sharing our experience with other members and also benefiting from their expertise so that together we can meet future challenges."

EXTRA HOME COMFORTS

Knauf Insulation has donated insulation to the Georg-Eydel house in the German city of Würzburg, a facility that supports single parent mothers and their children. Following the installation of insulation and airtight layers across 550m² of roof space the U-value at the house was an outstanding 0.149 w/m²K.



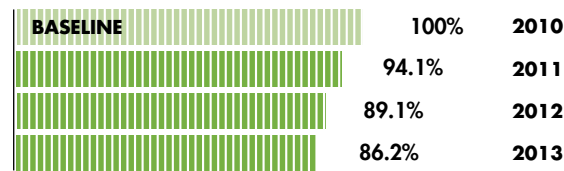
CITYSMART PARTNERSHIP

Knauf Insulation in Australia has become a key partner of CitySmart, the Brisbane City Council agency that aims to make Brisbane Australia's most sustainable city. Ravi Chandra of Knauf Insulation said: "The aims of the agency are aligned with ours in ensuring a sustainable future and promoting energy efficiency."

Figures behind our sustainability success

We continue to make excellent progress in waste to landfill, remain on track to meet our 2020 objectives for energy use and now have a new strategy to improve lost time accidents.

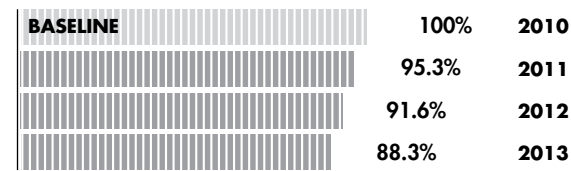
ENERGY USE Mwh/m³



Down 13.8% from baseline | Down 2.9% from 2012

We remain well on track to meet our 2020 objectives, having already reduced our energy per m³ of product by 13.8% since our baseline year thanks to process efficiencies and of course our energy awareness programme. We now have 5 years to reduce the remaining 6.2% and we are confident that we can achieve it, even as we grow as a company.

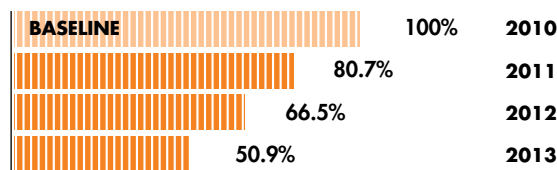
CO₂ Tons/m³



Down 11.7% from baseline | Down 3.3% from 2012

Our progress in CO₂ is intrinsically linked to our progress in energy. In a time where climate change is a real challenge, we are happy to see that we are reducing our CO₂ per ton every year, with a reduction of 11.7% since 2010 baseline and a reduction of 3.3% in 2013 against 2012.

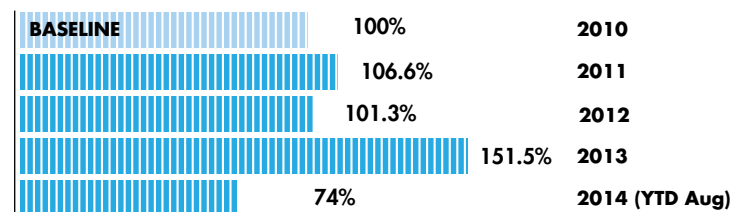
WASTE TO LANDFILL Ton/m³



Down 49.1% from baseline | Down 15.6% from 2012

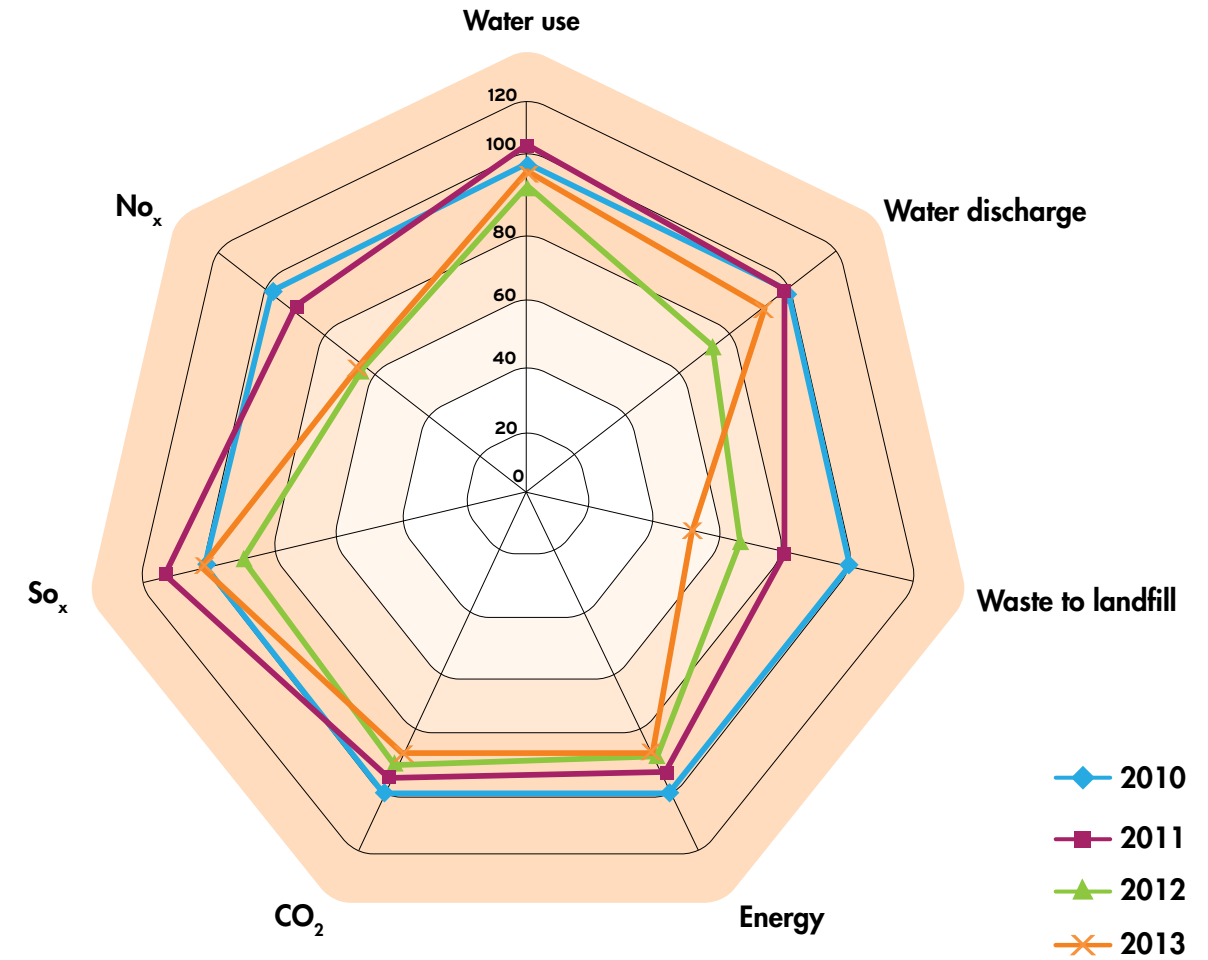
We have a hugely ambitious commitment to reduce waste to landfill to zero by 2020. This is driving us to look at every stage of production and think innovatively about how to reduce the amount of waste created, how we can recycle waste internally as well as how we can avoid landfill. Through innovation, partnerships and hard work we're seeing very positive results, with a reduction of almost 50% since our baseline year.

LOST TIME ACCIDENTS LTAFR (#LTAs/1M hrs)

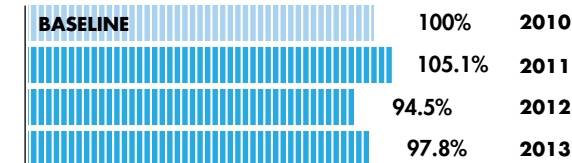


In 2013 up 51.5% from baseline | Up 50.2% from 2012

In 2012 we dramatically improved our accident reporting process, which we believe was a real step towards making Knauf Insulation safer. Better reporting has meant better understanding of why accidents happen in the first place and therefore how to prevent them. This is shown when we look at our 2014 mid-year figure, which is 26% down against our baseline year, even before reporting improvements.



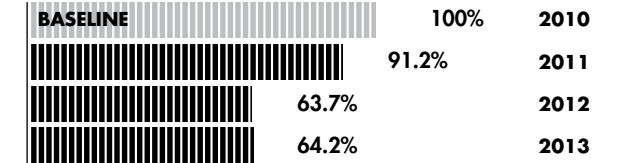
WATER USE m³/m³



Down 2.2% from baseline | Up 3.3% from 2012

Energy is our biggest impact and therefore focus but we still use a relatively small amount of water in our process for things like cooling and cleaning and we are conscious of reducing this, particularly in areas where water might be scarce. Currently our water use is stable, with a 2.2% reduction since our baseline and a 3.3% increase in 2013 vs 2012.

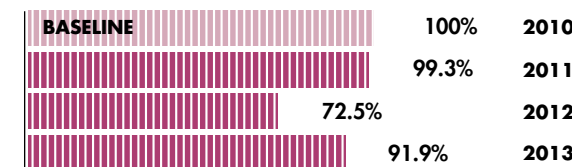
NO_x Kg/m³



Down 35.8% from baseline | Up 0.5% from 2012

Thanks to process efficiencies we have seen a significant reduction in NO_x emissions; 35.8% since our baseline year, remaining relatively stable from 2012 to 2013. As we continue to focus on energy efficiency we hope to improve this figure more.

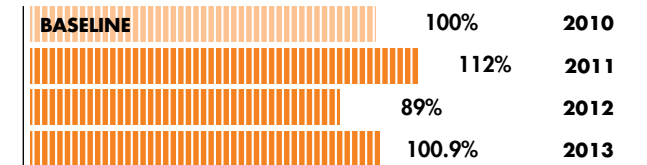
WATER DISCHARGE m³/m³



Down 8.1% from baseline | Up 19.4% from 2012

We discharge very small amounts of water but are still aiming to reduce that amount. From 2010 to 2013 we reduced the amount of water discharged by 8.1%. In order to improve this further, we intend to focus on better monitoring and reporting.

SO_x Kg/m³



Up 0.9% from baseline | Up 11.9% from 2012

The increase of our SO_x emissions is linked to the increase in recycled content and decrease in energy use. We forgo an increase in SO_x, which has increased by 0.9% since our baseline year, in order to be able to reduce our energy use as well as increase our levels of recycled content as these are much bigger impacts.

Sustainability Governance

We aim to be the world leader in energy efficient systems for buildings

OUR SUSTAINABILITY STRATEGY

As a producer of energy efficiency products and being a family-owned company we have always understood that we have a responsibility to think and act sustainably. Since the early 2000s we have focused on a number of initiatives relating to energy efficiency, product innovation, human resources initiatives and high-level policy advocacy. In 2010, we formalised our efforts with the establishment of a Sustainability Steering Committee and internal task groups to drive the sustainability agenda throughout the organisation. The outcome of this was a new strategy for sustainability at Knauf Insulation that sets out a clear path to help us become the world leader in energy efficient systems for buildings with sustainability at our core.

OUR SUSTAINABILITY STEERING COMMITTEE

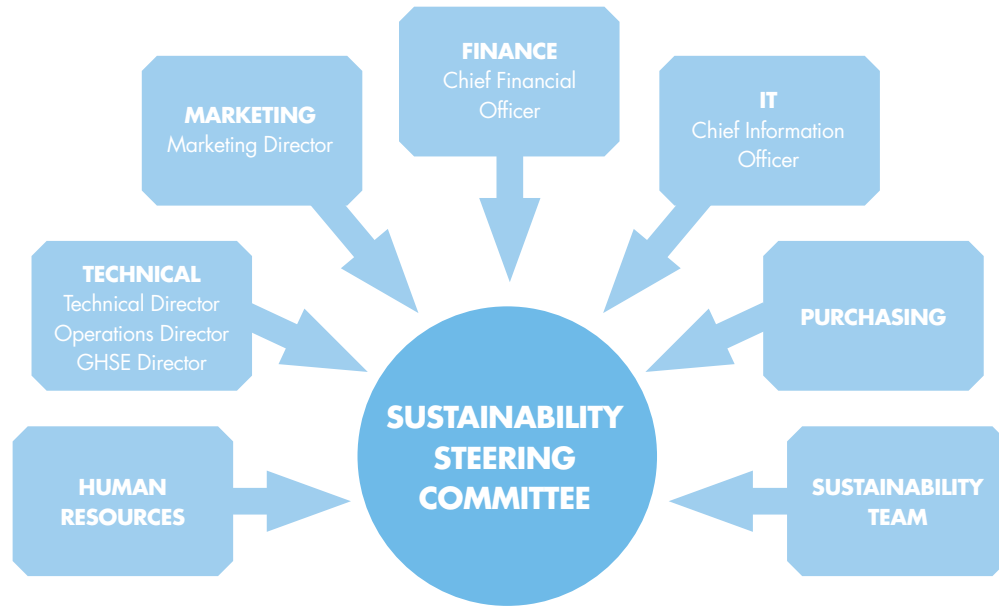
Our Sustainability Steering Committee is comprised of people from operations, marketing, human resources, purchasing, regulatory affairs, technical, finance and public affairs. Four Task Groups were set up to ensure that clear objectives, measurable progress and adequate resources were in place to deliver the strategy. Through this process we have identified our key issues.

OUR LONG TERM AIMS

Through this process we have identified the three key objectives and set nine long-term aims that will guide our decision-making going forward.

PRIORITIES

We are working hard to achieve each long-term aim, but given that we are an energy intensive manufacturer our biggest areas of impact are energy and waste. Since 2010, our baseline year, we have achieved a reduction of 13.8% of energy and an impressive 49.1% reduction in waste to landfill. This is well on the way to achieving zero waste to landfill by 2020 and reducing energy 20% by 2020. And in a world where energy security and Circular Economy are important trends, we are right to be focusing our efforts on these areas.



| THREE OBJECTIVES | NINE LONG-TERM AIMS | TARGETS AND PROGRAMMES |
|---|--|--|
| Be recognised for championing energy efficiency in buildings | Leading advocate | Ensure a robust regulatory framework for delivering low energy new build, mandatory renovation of buildings and mandatory real performance of buildings by 2020 through capacity building, informing the business and advocacy |
| | Zero carbon building stock | 20% reduction of CO ₂ from our building stock by 2020 through internal building programme |
| Products recognised as best in class in terms of sustainability | Products best in class for sustainability | To be in a knowledge position that contributes to a product offering that is right to improving the sustainability of the built environment through the LCA Programme |
| Be recognised as a responsible manufacturer and employer | Zero carbon production | 20% reduction by 2020 through energy efficiency targets and programmes |
| | Zero negative impact on resource use | Substitution of resources for those with a less negative impact on resources use as identified through Life-Cycle Assessment, towards eco-design |
| | Zero waste to landfill | Zero waste to landfill through local waste programmes combined with central monitoring |
| | Zero waste water discharge (from production) | 50% reduction by 2020 |
| | Zero Harm | 50% reduction by 2020 |
| | Strongest Triple-E sustainable people strategy | To continue implementation of the Triple-E sustainable people strategy starting with best practice sharing programme |

NATURE MEETS THERMAL INSULATION



ARCTIC WHITE Wood Wool Insulation Inspired by Nature

FIRE SAFE • ACOUSTIC • THERMAL • DURABLE • ECO-FRIENDLY



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KNAUF INSULATION

it's time to save energy

KNAUF INSULATION is one of the world's largest manufacturers of insulation products and solutions. With more than 30 years of experience in the industry, we represent one of the fastest growing and most respected names in insulation worldwide.

Our business is energy efficiency. We're committed to meeting the increasing demand for energy efficiency and sustainability in new and existing homes, non-residential buildings and industrial applications by driving standards to improve initiatives around the world.

To see more on our organisational profile, see the 'about us' section of our website www.knaufinsulation.com



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