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INSULATION MATTERS

KNAUFINSULATION
it's time to save energy

*Pioneering product sustainability
Showing what's needed to renovate
Scoring points in green building schemes
Insulating Australia's most isolated town*



NATURE MEETS ECO-FRIENDLY INSULATION



FOREST GREEN

Wood Wool Insulation Inspired by Nature

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



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MOTHER NATURE APPROVED



Mineral wool insulation was already considered the best performing insulation material in terms of its low environmental impact. The main raw materials are sand and recycled glass, both natural and part of world's most abundant and renewable resources.

When Knauf Insulation introduced ECOSE® Technology, our revolutionary formaldehyde-free binder, we were the first to add a bio-based binder, based on rapidly renewable materials instead of petro-based chemicals. So it's safe to say our mineral wool is Mother Nature approved.

www.knaufinsulation.com

KNAUFINSULATION
it's time to save energy

with **ECOSE®**
TECHNOLOGY

Here to help

The pace of change in our industry continues to accelerate. Across many of the regions where Knauf Insulation operates, new energy efficiency laws for buildings are coming into force. At the same time governments are trying to understand how to capture the potential energy savings from the existing building stock. As a company that believes at its core in the need to save energy, it's critical to work hard to help our customers and partners deliver this change in reality.

The region where regulation is moving the fastest for new buildings is Europe. Plans for moving to near zero energy buildings by the end of the decade are being finalised and the first major steps towards this standard are coming into force. For the thermal renovation of buildings we see a more uneven situation. In the US in certain states there are new and ambitious moves ongoing, such as the Green Bank initiative in New York State. Whereas in Europe at one end there is France committed to renovating 500,000 buildings a year and on the other extreme the UK where their flagship renovation initiative, the Green Deal, is failing because of the current government's unwillingness to put in place drivers for action. But wherever action is taking place, it is key that Knauf Insulation plays a role in helping to deliver a better outcome.

Therefore as I look at what we are doing I am proud of what I see. In Australia we renovated the most isolated town in the country, showing that it's easy and cost-effective to insulate. In the US and the UK, we are piloting one-stop-shops for energy efficiency retrofit, where we are moving out of our comfort zone to help keep our customers in theirs. And beyond this we are developing new solutions to help with these new challenges; our new Urbanscape solution for green roofs is just one example where we are helping deliver both improved energy efficiency as well as better water management.

The pace of change will not slow for our industry any time soon and therefore our future must be in supporting our customers with this change. Not only developing better products and solutions that help deliver low energy buildings but also organising ourselves in such a way that we are better able to support all of our partners. From governments who develop the regulations to contractors that have to implement them on the ground and through architects and others that have to understand how to design buildings, we need to be there to help.



Tony Robson
CEO Knauf Insulation

News in brief



Werkstage workshop in Germany

INSULATION ACADEMIES ACROSS EUROPE

Our insulation academies are helping people across the construction industry learn even more about insulation – from technical properties to installation instructions. In the UK, we opened our ThermoShell® Training Academy in Birmingham to up-skill contractors from various trades, enabling them to install innovative ThermoShell Internal Wall Insulation (IWI) and External Wall Insulation (EWI). In Germany, we continued the Knauf Werkstage, a series of two-day roadshows from January to March, in Bochum, Stuttgart, Nuremberg, Mainz, Leipzig and Hamburg, which pools expertise from nine companies from the Knauf Group. Some 17,000 installers – mostly from skilled craft and trade attended this year. In France, we have our 'Insulation School' (Ecole de l'Isolation™) which is our training centre that provides courses on insulation and its installation. The Ecole de l'Isolation™ opened in 2012 and is a recognised training organisation.



Oosterhout wins Greenest Company of the Month

International recognition through company awards

Our UK plant in Queensferry won the Flintshire Business Award for Environmental Performance and Sustainability in 2012. And in 2013 the awards kept coming. In Slovenia, Knauf Insulation was awarded the most energy efficient large company in 2013, while in Oosterhout, Netherlands, we were awarded 'Greenest Company of the month' for the district in June. In Serbia, we were awarded the Green Building Award from the Serbian

Green Building Council in recognition of supporting sustainable initiatives in Serbia. As for Knauf Insulation OEM Solutions, we received the prestigious "Golden Q" Award from Bosch Siemens Hausgeräte (BSH) for outstanding quality and service, while Knauf Insulation Ukraine was awarded Best Importer of Glass Wool in the Ukrainian National Business Rating by the State Statistics Committee.



HEADING EAST: *joint venture in Abu Dhabi*

In March 2013 we signed an agreement with Exeed Industries LLC to acquire a holding in their subsidiary in Abu Dhabi.

We are now integrating our state-of-the-art production know-how and technology, including ECOSE® Technology, our formaldehyde-free binder technology. We are very pleased to partner with Exeed Industries LLC, the premier industrial group in Abu Dhabi, in this venture and look forward to further joint investments in the region.

Above and beyond

*Urbanscape green roof
and landscaping systems
launched globally*

Our green roof solution Urbanscape was launched this year, including markets in Slovenia, the Netherlands, the US and even the Middle East. Urbanscape is an innovative and easy to install system with high water retention capacity designed specifically for Green Roof systems as well as for landscaping areas such as residential gardens, golf courses, commercial spaces, cemeteries and parks. See our new website at www.green-urbanscape.com



WASTE: *endless possibilities*

We're on the road to zero waste to landfill, but still produce some waste. Through innovative collaborations, however, we're finding ways of putting our waste to good use. Our waste Wood Wool has been used to produce everything from pig stys to park benches. We're constantly looking for opportunities to use Wood Wool as a new material. The possibilities are endless.



Restart of our Lanett plant

Knauf Insulation North America is re-opening its Lanett, Alabama plant approximately two years after curtailing production amidst a severe housing downturn. About 50% of the plant's new employees worked in the facility before the curtailment, demonstrating these workers' strong commitment to the plant and to the company. In 2010, this plant was named Air Conservationist of the Year by the Alabama Wildlife Federation. The award recognised the facility for significant emissions reductions and a commitment to sustainable manufacturing processes.

PIONEERING PRODUCT SUSTAINABILITY

Knauf Insulation is among the pioneers of product sustainability as it continues to provide the market with more and more information on the environmental footprint of its products than ever before. Through its innovative Environmental Fact Sheet, currently available for all Wood Wool, and its preverified Environmental Product Declarations, Knauf Insulation is becoming a main player in the field of product sustainability of construction products.

TIP CHECK? CHECK!

Our Skofja Loka, Slovenia plant has completed its first 'TIP Check' audit in 2013. 'TIP Check' (Technical Insulation Performance Check) audits are carried out by EiiF-certified auditors who have followed a special training programme. Its goal is to identify potential insulation improvements that help achieve higher energy efficiency in industrial facilities.

So far, early results show our Skofja Loka plant already has high insulation standards in place. Still, the 'TIP Check' audit should provide recommendations on how to go beyond current efficiency levels.

CLIMOWOOL ACQUISITION

As of February 2013 Knauf Insulation acquired Schwenk Dämmtechnik's Glass Mineral Wool business and its well known Climowool brand. We welcome approximately 150 new colleagues from Schwenk Dämmtechnik, the state-of-the-art glass wool manufacturing site located in Bernburg (Saxony-Anhalt), Germany. This acquisition is an important expansion in one of our key markets.



The global headquarters of the Knauf Group in Iphofen, Germany

FUTURE VISION

Alexander Knauf, General Partner of the Knauf Group, offers unique insight into the company's entrepreneurial spirit, its plans for expansion and how investment will shape future success.

In the heart of the Germany countryside, outside the pretty medieval town of Iphofen, is the global head office of the Knauf Group.

After the frenetic roar of trucks and high-powered cars on the autobahn, the company's spacious atrium, minimalist art and bold architecture are an oasis of calm.

This sense of calmness extends to the immaculate office of Alexander Knauf, the man who in 2013 became the company's general partner with overall responsibility for the Knauf Group.

It's an interesting time for the company. Knauf's appointment coincides with considerable transition within the group and a renewed commitment to extensive expansion and investment.

The Knauf Group has always enjoyed a disciplined position after consistently following a policy of reinvesting profits back into the company.

So what's the next chapter in the Knauf Group story? After a busy day, "taking care of people", Alexander Knauf settles down to explain.

Q What are the key elements of your job at the moment?
A I like to allocate my time to growth and solving problems. Of course, I prefer dealing with growth rather than problems.

Q What does growth mean to you?

A Growth entails developing our business together with our employees. It's about creating a vision, realising opportunities and supporting our people in that growth. Our business is always local whether we are in the UK, Turkey or the US. Wherever we are, that's where we do business. At the end of the day this means a lot of travelling.

Q What was your first job?

A It was in the UK where I used to sell gypsum boards armed just with a laptop, mobile phone and a car. I got to know Knauf at a very basic level. It was a great opportunity to see what our customers want and what they expect from us. Also it was a chance to learn how to go that extra mile for customers.

Q With your name on the products, it must have been hard to find a place to hide.

A Sometimes there would be funny situations at building sites where people would see my business card and go, 'Oh, Knauf. Really?' Sometimes they would even be impressed. I've very good memories of this time in the field.

Q What happened after the UK?

A A vacant position in Copenhagen came up and I took over our Northern European business. It was good time to be there. I experienced the full cycle - boom to recession - and the entire business spectrum from acquisitions and integrations to developing new things and shutting other things down. I was able to learn a great deal there. In 2011 I took over our operations in Germany and Switzerland and became general partner in 2013.

Q In a word how would you describe the history of the Knauf Group?

A Entrepreneurial. In 1932 my grandfather and his brother were mining engineers. At that time, it was impossible to find a job in a mine so they took their fate into their own hands and started their own business.

Q What are your favourite examples of this entrepreneurial spirit?

A At the end of the 1970s when the two big insulation manufacturers in the US merged, they had to divest their plant in Shelbyville. They withdrew all competence, left the rest behind and sold it to someone who they thought would not be a threat from another continent, my family. Today Knauf is one of the most significant players in the North American market.

Q What were the key challenges as the company grew?

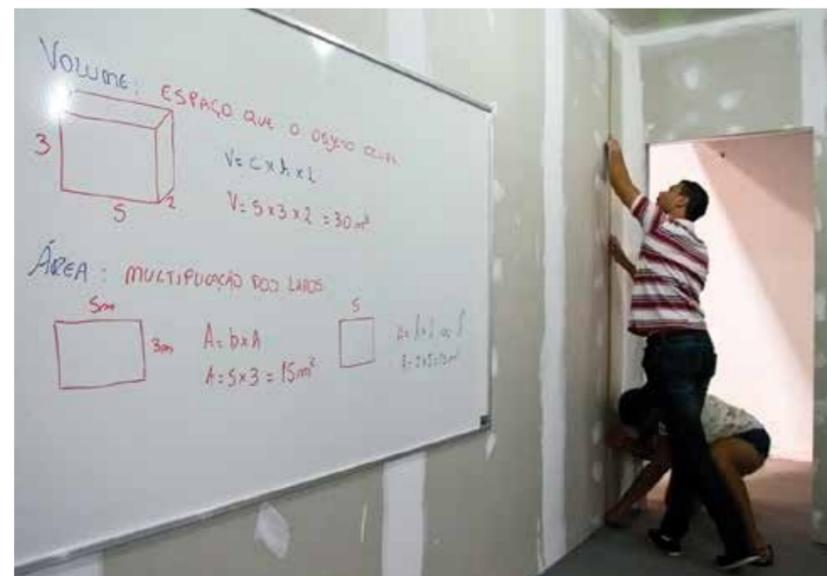
A There were many. At the end of the 1980s, for example, the gypsum market was very territorial. There was Germany there was the UK and there was France. Everyone kept to their countries. Suddenly the British acquired our biggest competitor and said: "Make market, Knauf is nothing but a toothless tiger." Our choice was to fight or surrender. So we retaliated. Hard. We built four plants within three years in France, Spain, and two in England.

Q So, expansion is a Knauf hallmark?

A Knauf is about opportunities. For example with the opening of Eastern Europe, Knauf was fast to expand into this new market. I think that is down to our governance structure, we are able to make faster decisions and able to enter more risky positions because we don't have any shareholders that we have to respond to.

Q What is Knauf's investment strategy?

A We only invest our own money. We don't invest anyone else's. We are in a comfortable position to afford a major ►



KNAUF'S CSR ACTIVITIES

The Knauf Group has always been committed to corporate social responsibility.

For example, in the favela neighbourhood of Nova Holanda in Rio de Janeiro young people are being given the chance to enjoy a bright future by learning a profession through a KNAUF-IRESCO Drywall Installer Programme.

IRESCO is an organisation committed to supporting vulnerable youngsters in Brazil. The first class graduates at the beginning of 2014.

The Knauf Group also has a policy of re-naturalising quarries after gypsum has been removed. "If you compare the biological life before and after we have naturalised it, there is a much richer bio-diversity of plants, birds and animals than before," says General Partner of the Knauf Group, Alexander Knauf.

STRONG INVESTMENTS

Knauf Insulation continues to see strong investments:

IN 2013

- the acquisition of Schwenk Dämmtechnik (Climowool) (February 2013)
- the start up of our Tyumen plant (September 2013)
- an agreement with Exeed Industries LLC to acquire a holding in their subsidiary in Abu Dhabi (March 2013)
- the restart of our Lanett (US) plant (November 2013)

IN 2014

- the start up of line two of Nova Bana - with state-of-the-art fibre technology (March 2014)
- the reconstruction of our Eskesehir plant (end 2014)





‘The family continues to invest heavily into its business and this means opportunities and a long-term healthy future for our employees’



COFFEE, CHILDREN AND LESSONS IN BUSINESS

How do you relax?

I have a very young son at home. Nothing is better than coming home to a toddler's smile. My life centres around my small family and the business.

What business lessons have you learned?

Only hard-working people tend to be lucky more often. I prefer to only talk about achievements once they have been achieved.

What are you doing today?

I am taking care of people and giving them the means to make sure they do the right things. Later a former colleague is coming over for coffee.

acquisition without asking a bank. We reinvest virtually 100% of annual surplus because reinvestment fuels our growth. I never want to have a bank telling me what to do.

Q But how does Knauf handle times of recession?

A We invest heavily in technology that enables cost leadership. We are world class in our industry at producing at lowest possible cost and world class at developing and marketing our systems. Heavy investment gives us cost leadership and makes us recession proof.

Q The company now is going through a time of transition. What are the most significant changes?

A My father and uncle knew the company inside out because they grew it for 40 years. They also had the unlimited trust of the family to do the right things. Five years ago we installed non-family management that are not shareholders. Therefore new rules are slowly coming in. We are going through a phase of “institutionalisation”.

Q How has that impacted the family's approach?

A The family's commitment is unchanged. We like to look closely at how the company is developing and that it is heading in the right direction. This means we need to move towards a constructive dialogue with the family shareholders and introduce a more formulated decision-making process.

Q In what way?

A In the past my father and uncle would have, say, 40 direct reports with a complexity only they understood. Ahead of the generation shift we have installed a group management that incorporates more senior managers to seek to maintain an entrepreneurial approach in a decentralised way. Another example is HR. Knauf has a clear preference to recruit internally. And for that reason we are stepping up our efforts in talent management. We like to offer more opportunities to developing our people for their next role.

Q But family values are still important.

A My father and uncle are right now celebrating the 20th year anniversary of Knauf in Russia, so the family is still engaged and involved. Our employees are part of this family. They own the business, they are partners, they feel entrepreneurial.

Q You recently identified Knauf's values as commitment, partnership, entrepreneurship and 'menschlichkeit' or the human aspect. Why?

A This is not some corporate poetry. I think these values have always been within Knauf right back to the time when my grandfather would visit workers in the factories at weekends. He knew their families as well. Given the size of the company it is not possible anymore to interact in the same way. So we had to find a way to make the values accessible for every one. We are also articulating them clearly now. I think if you asked our employees if they apply you would get a high degree of agreement.

Q But in such a rapidly expanding company how do you ensure that those values are not lost?

A You walk the talk. Our partners are responsible for the values, our managers, everyone. Now we have calibrated these values, we are exploring their intention and actively looking at ways we can enhance them, how we can do things better.

Q What does the future hold for the Knauf Group?

A We have an exceptionally broad range of technologies and building materials and there is still a lot of potential in geographical expansion in regions such as Asia, Africa and Latin America. We will also significantly increase the use of our products in existing markets. So, there is still a huge potential for Knauf to grow.

Q What advantages does Knauf have over its competitors?

A Internally it is a mix of highly motivated and talented employees, a family committed to the business and the right culture of entrepreneurial spirit. For our customers, due to the great range of our portfolio, we are in a unique position to offer solutions. For example, an architect doesn't want just a screw he wants a technical solution that fits the budget. We have multiple technologies and we can offer everything that the architect might require to design a building - from interior to exterior solutions.

Q And what is Knauf's market approach?

A Knauf takes a premium approach. We are not the cheapest in the market because we offer more than a commodity. We offer an added value for our customers. We offer solutions. As said earlier, we invest heavily to get a cost leadership position with better prices and lower costs. This gives us margin and higher results. Combined with our investment strategies, this approach gives our employees more opportunities as we enjoy more development and higher growth. This is a very sustainable business model.

Q What role does sustainability play?

A Obviously a critical role in everything. Sustainability is a matter of survival, so it is at the heart of everything we do. There are many, many examples, but, for instance, our gypsum can be recycled endlessly; sustainability is at the core of Knauf Insulation, our solutions are all about saving energy, saving money and cutting emissions; we re-naturalise our quarries after taking out the gypsum to provide a rich natural biodiversity with rare species; we recently were rewarded for being the most sustainable company in this region despite being an industrial company; we are constantly examining ways of reducing our use of energy in manufacturing... Sustainability at Knauf is a vast subject. And I am convinced, Knauf is very good at it.

Q So what is the next chapter in the story of Knauf Insulation?

A Globally, there is an increasing demand for insulation products. Knauf Insulation will participate and capitalise on this opportunity. This year we will commission our new plant in Tyumen, Siberia. Next year we will have a new factory operating in Turkey. There are more to come. This means opportunities and a long-term healthy future for our employees. ■

Survival OF THE *fittest*

Hundreds of billions of dollars are being wasted as a result of lost energy from buildings. Tapping this potential creates millions of jobs, drives economic growth, slashes carbon emissions, reduces reliance on foreign energy and boosts international competitiveness. What's not to like?

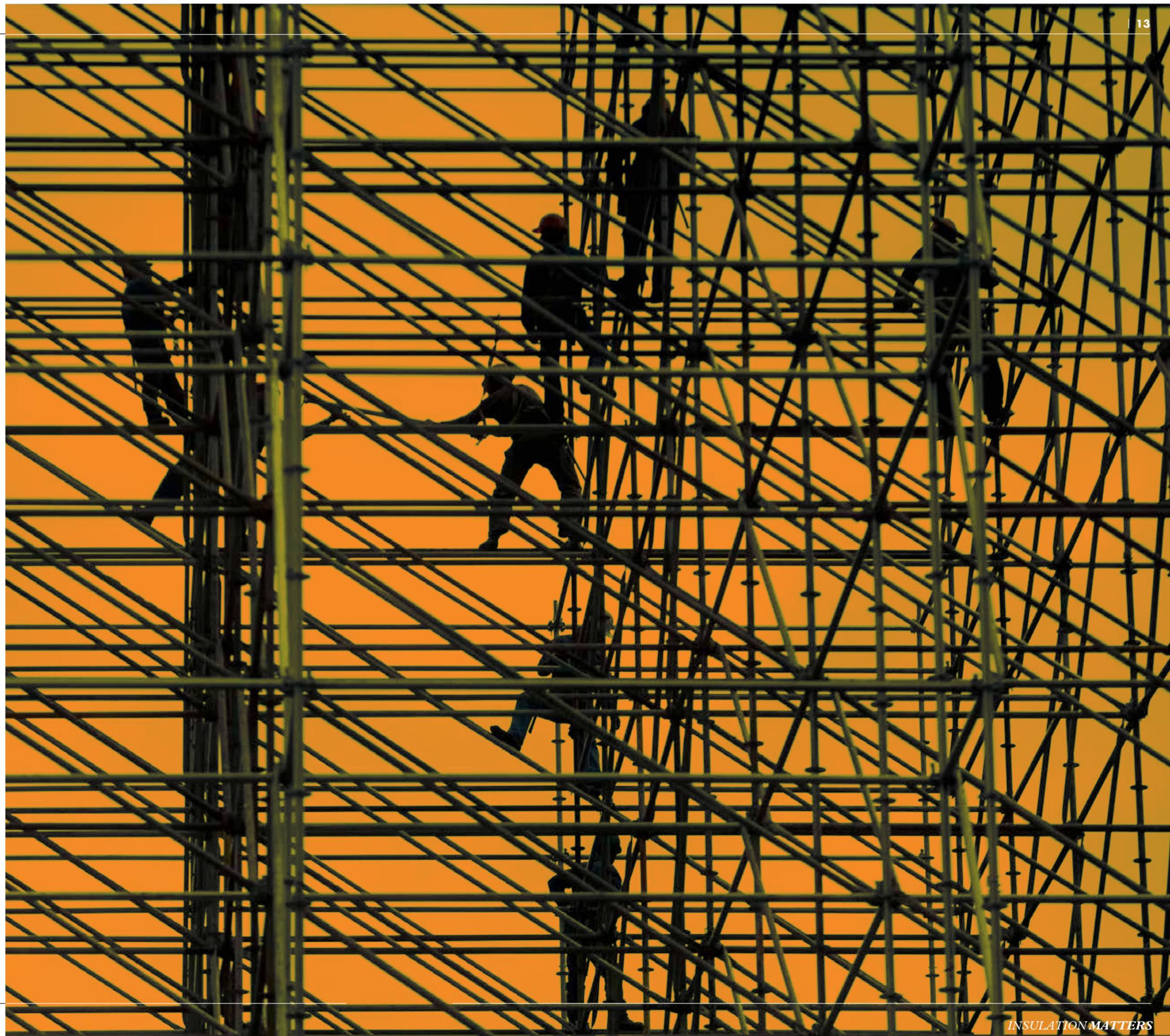
"**Look, being** competitive is not rocket science," says Tony Robson, CEO of Knauf Insulation. "You simply out-perform your competitors by making sure you are highly efficient and adaptable enough to take advantage of every market change."

Unfortunately, energy inefficiency is crippling competitiveness. In Europe, for example, a staggering €500 billion is wasted as a result of lost energy from the economy. Every year.

The building industry is responsible for 40% of lost energy in Europe and more than 80% of its buildings are haemorrhaging cash because they are energy inefficient.

"And whose money is being wasted? Everybody's," says Robson. "Money from tax-payers, homeowners and governments is simply disappearing and going straight to the pockets of energy companies abroad."

Combine these factors with the volatile price of dwindling stocks such as oil and gas and increasing global demand from emerging economies and it's a recipe for competitive disaster. ►



Clearly, it's time to save energy, not spend time wasting it. Being energy efficient sharpens a nation's competitive edge and reduces its reliance on foreign imports. Europe's €500 billion bill last year was worth around 12 million barrels of oil a day.

"Imagine if that money had been spent within Europe's economies," says Robson. "It could have been used to get people back to work and put money into job creation.

"Imported energy creates a big hole in countries' pockets. In many places every time people turn on their thermostat that money disappears abroad. It's not like any other expenditure, such as getting your shoes repaired, where money is spent locally and fuels the local economy."

Knauf Insulation's Public Affairs team is dedicated to keeping the issue of energy efficiency at the top of national agendas at every level from supporting governments to introduce regulation and initiatives to drive energy efficiency to helping homeowners understand how they can save money by cutting the cost of their bills.

It's vital work, because if governments fail to take action to stop the flow of money abroad they instantly undermine their country's competitiveness. Take the example of Greece. Due to the tough economic climate, demand for domestic heating fell by a staggering 69% over five months from October to February 2013 as people turned off their heaters to save money.

The Greek government's solution? Give away money in the form of subsidies to be spent on heating fuel. The Irish government did the same. This was clearly a false economy. "That money was only used once and disappeared to fuel-producing countries rather than being invested in energy-



PICTURE: COURTESY GREENPEACE

Winter heating demand in Greece dropped by 69% due to high prices. 'I'm cold at home,' reads this placard from Greenpeace. Greenpeace urged the Greek government to provide energy improvements to houses instead of spending money on fuel subsidies.

saving measures that would pay off for years," says Robson.

One of the leverage points available to Europe is energy efficiency.

Rather than provide fuel subsidies, countries should be using energy savings to mobilise workforces to make homes more energy efficient. Barry Lynham is Group Director of Strategy and Communication at Knauf Insulation. A huge part of his job is convincing governments that energy-saving renovations will save billions of euros in the future, create millions of jobs and make countries more competitive "We need to get a lot of work done and it can all be paid for by the money that is currently being sent abroad to energy producers," says Lynham. "It's good money and it could be spent fuelling our economies rather than heating our homes." ▶

Are governments letting a lack of energy efficiency cripple competitiveness?



Energy efficiency improves industrial competitiveness

INDUSTRY'S BIG OPPORTUNITY

A shared concern in all countries is how to reduce energy demand in industry without compromising productivity.

The answer is simple, reduce energy needs through energy efficiency and productivity can increase while reducing its environmental footprint at the same time.

"Energy efficiency opportunities are still largely underexploited in industry despite being cost-effective to implement and quick to provide a return," says Carlos Nicolas, Segment Marketing Manager for Technical Solutions at Knauf Insulation.

"In a report commissioned by the European Industrial Insulation Foundation (Eiif), it was found the payback for investments on better insulation could be as little as one to three months. Energy efficiency is the one resource governments can exploit in their attempts to improve industrial competitiveness," he adds.



GREEK TRAGEDY

Against a backdrop of public protests, severe job cuts, high taxation and tough economic measures, winter demand for domestic fuel in Greece dropped by 69% as homeowners across the country switched off their heating to save money. The Greek government decided that

to help low-income earners it would provide them with a fuel subsidy. Rather than spending money on subsidising energy costs, the money should be used to provide energy improvements for homes, said Greenpeace.

"We can upgrade the economy, by upgrading our homes," said the organisation. If a million Greek homes were renovated, with low-income earners given

priority, 43,000 jobs would be created, up to 150,000 tons of fuel imports per year would no longer be required and the lives of hundreds of thousands of households would be improved.

Commenting on the campaign, Knauf Insulation's General Manager for Greece, Dr. Yiannis Koutoulis said: "It is clear that money given out for heat subsidies will keep some people

warm for just a few months and will go straight out of the country, to the pockets of energy producers.

"If the money was used for energy improvements in homes, the benefits of insulation would keep people warm for years to come and the money would stay in the country. The benefits would be considerable for people and for the economy."



In addition to competitiveness, there is also the issue of dwindling energy demand. As traditional global supplies dry up, those countries that have unlocked energy savings and operated more efficiently will have a massive competitive advantage over those that haven't.

Countries know all this. China is targeting 16% energy cuts by 2015; Japan aims to slash electricity use by 10% by 2030 and the European Union has committed to cut energy demand by 20% by 2020, but even if they succeed it's not enough.

Even with these new policies in place, four-fifths of the

potential in the buildings sector and more than half in industry still remains untapped, says the International Energy Agency in its most recent World Energy Outlook report.

To be a serious competitor in the global market it's critical to be energy efficient. And the best place to start is by tapping the huge potential of buildings.

"Imagine if nothing changed? Our children will look at us with amazement that we took all this hard-earned money and threw it on the fire rather than creating a better future," says Lynham. ■

IN NUMBERS:

€500bn
Annual cost of wasted energy in Europe

80%
Percentage of EU buildings that are energy inefficient

THE BIG PAYBACK

If minimum energy savings of 30% are set as solid targets for 2030 by European legislators Europe's GDP will increase by at least 1% and 1.5 million new jobs will be created.

This ambitious prediction was outlined by Knauf Insulation and 21 other international companies in an open letter to

leading European politicians urging them to look beyond the EU's non-binding 20% energy saving target set for 2020.

The companies, all members of the European Alliance to Save Energy (EU-ASE), state: "It would be a mistake to see a trade-off between the need for a climate and energy regulatory

framework for 2030 and the need to restore economic competitiveness.

"The higher the ambition for 2030, the better it will be for the economy and we, as industry representatives, will be doing our utmost to seize the opportunity."

A minimum 30% target by

2030 would improve economic growth, boost employment and enhance competitiveness as well as cut Europe's current energy imports of €573 billion by 40%, leading to a reduced price tag for energy of €50 billion by 2030, equivalent to the electricity sales in France for 2011, says EU-ASE.

8 STEPS TO SUCCESSFUL RENOVATION

Ambitious renovation roadmaps, as required under the EU's Energy Efficiency Directive, will help countries remain competitive. Every 'roadmap', due in April 2014, will outline how each government intends to make their entire building stock - private and public - more energy efficient by 2050.

It's a challenge. So, to make life easier for governments, the European Insulation Manufacturers Association (Eurima), to which Knauf Insulation is a member, has created a guide to 'road-mapping'. This guide can be freely downloaded from www.eurima.org. Here are the key recommendations:

1 THINK BIG

A high level of ambition, a long-term perspective and a high level of political ownership will provide key actors with the time to plan, prepare for changes and see results. A 2050 horizon would be the best option.

2 SET TARGETS

EU building stock could reduce its consumption of energy by 80% by 2050 with a good annual rate of renovation. Clear targets and milestones need to be set based on sound analysis as well as factoring in ways of improving performance supported by robust monitoring.

3 SUPPORT ALL LEVELS

Support and collaborative involvement from all levels of government, market actors and stakeholders is critical. All parties need to be consulted and all parties need to play a role in implementation.

4 BE ADAPTABLE

Roadmap development requires flexible but focused development. Strategies and action plans may need to be adjusted after years of implementation due to changing market conditions.

5 WORK HOLISTICALLY

Roadmaps need to address every aspect of the buildings and construction sectors, including

technologies, materials, labour, training, accreditation and certification. Financing of buildings and renovations, full engagement of building owners and occupants and the removal of legal and regulatory barriers are all critically important.

6 BUILD ON STRENGTHS

Roadmaps need to build on the strength of market parties, enabling the market to deliver what society needs. Energy performance needs to be integrated with broader social goals including focusing on employment impacts and taking into account social, demographic and housing changes.

7 THINK CREATIVELY

Flexible, creative thinking needs to be factored in. Good roadmaps encourage innovation in technologies, markets and collaboration between parties so that there is on-going cost and efficiency improvement of building renovation.

8 UNLOCK SUCCESS

Financial support, consumer education and organisation support are all critical. Financial mechanisms are vital for investment in deep renovation; programmes are important to inform the public and building sectors about new policies and requirements and provide support for the design, commissioning, construction and supervision of renovation.



Renovation changes lives: from all types of home to all varieties of public building, it's time to save energy

Renovation revolution

Renovation of the building stock has the potential to transform lives. But in a climate where finance is scarce, where will the money come from?

There are 220 million buildings in the European Union today and 160 million of them will still be around by 2050. Renovating these existing buildings will save energy, boost economic growth, create jobs and cut emissions. In the US, there are an estimated 67 million under-insulated existing homes.

Continuous campaigning has pushed the issue of renovation up the international agenda resulting in measures such as the EU Energy Efficiency Directive. Through a recent report commissioned by the Renovate Europe Campaign, which is supported by Knauf Insulation, the business case for renovation has been made even clearer; a programme of energy efficient renovation of the EU's existing building stock could create up to 1.48 million new jobs and boost GDP in the period to 2017 by up to €291 billion while delivering permanent annual benefits to public finances of up to €39 billion.

But in order to get renovation going it is important to have the backing of government, ease of access to finance, demand drivers to take up energy-saving renovation and then an environment of trust that ensures the entire process operates with integrity.

FINANCING

Overcoming the finance challenge is key to delivering a renovation revolution.

An estimated 100 billion euro a year is needed to renovate the European building stock alone, by 2050. This neither can nor needs to come from subsidies alone. Instead what is needed is smart finance solutions to bridge the gap between today's costs and tomorrow's energy savings.

In Germany, for example, the government-owned development bank KfW provided €9 billion of low-cost loans and grants for energy efficiency in buildings which further leveraged almost €27 billion.

Meanwhile, Knauf Insulation has also been working to create new financial structures for renovation. For example, the company is collaborating with the EBRD (European Bank of Reconstruction and Development) to put in place a finance facility to support energy efficiency renovation. "Slovenian Banks are struggling to provide finance to good energy efficiency projects in the residential sector. ►

"We hope to put in place a financing facility that will advise residential stakeholders on what are the best ways to cut their energy bills and ensure that these projects can get financed through local banks, saving energy and helping Slovenia to address its international commitments under EU Climate Change targets," said Alexander Hadzhiivanov, Senior Engineer at the European Bank for Reconstruction and Development.

SUBSIDIES

Subsidies can be very effective in giving a bit of extra help to those who need it the most, in particular low-income and vulnerable households or by targeting particular measures. And when we have subsidies to help those people, society benefits - people get jobs, they pay taxes, VAT is collected from the products sold and energy imports go down. Subsidies have proved very effective in tackling lofts and cavity walls in the UK for example.

DRIVING DEMAND

Recent experience has demonstrated that additional incentives are needed to encourage renovation at the scale required.

In the UK, for example, Knauf Insulation has been vocal in its call for 'demand drivers' such as introducing lower house sale taxes (known as stamp duty) for homeowners who have carried out energy-efficient renovations and higher sales taxes for those who have not. "Something to drive demand, like a stamp duty linked to energy performance, is absolutely necessary in order for people to commit to renovating their homes. If you don't give people that incentive, then you can have all the good will in the world, but renovation just won't happen, which is exactly what we've seen here in the UK with the Green Deal, with less than 200 houses Green Dealed since the launch in January 2013," says John Sinfield, Managing Director for Northern Europe. The Green Deal is the UK's energy efficiency programme which is linked to energy bills, itself an innovation in terms of financing renovation. Acceptance of the scheme is very low due to government missing out valuable pieces of the puzzle, namely demand drivers.

White certificates - tradable documents that certify energy savings measures have taken place - are also another possible demand driver. "In Italy, we are discussing with Italian policy makers how these certificates can be used to help unlock the thermal renovation of buildings together with the existing fiscal incentives for energy renovation," explained Fabio Staffolani, Managing Director for Knauf Insulation Italy.

FACILITATION

It needs to be easy for homeowners to renovate, whether that be through ease of installation or through properly understanding the potential benefits of the savings relevant to their home and their circumstances. 'Plug', a



simple yet comprehensive online tool, has been developed by Knauf Insulation to enable homeowners to quantify the money wasted each year against the cost of the measures to rectify the waste.

"We're taking the initiative to make renovation as easy as possible with a one-stop seamless process that is trusted and tested," says Knauf Insulation's Steven Heath, Public Affairs Director Northern Europe.

Currently being piloted as the Energy Response Corps in the US and Energy Response Force in the UK, these energy response teams are helping identify the simple changes required to help homeowners 'start winning and stop losing'.

TRUST

For renovation to really take off, it's also important to ensure that consumers can trust both that work being done is done well and also that the promised savings will be delivered. A good example of such an approach is the certified system for installers of cavity wall insulation that the government in the Flemish region of Belgium introduced in 2012. The certification system assures not only the highest quality product but also requires all installers to comply with an extensive set of specific technical requirements when insulating a cavity wall, regardless of the product. This system is unique in that consumers can only apply for this cavity wall insulation subsidy once it has performed according to the provisions of this certification system. Over a period of one year more than 12,000 houses' cavity walls have been insulated, totaling 1.2 million m². Knauf Insulation is the market leader in Belgium with our lead product Supafil Cavity Wall, which has a declared and controlled lambda value of 0.034. ■

IN NUMBERS:

1.48m

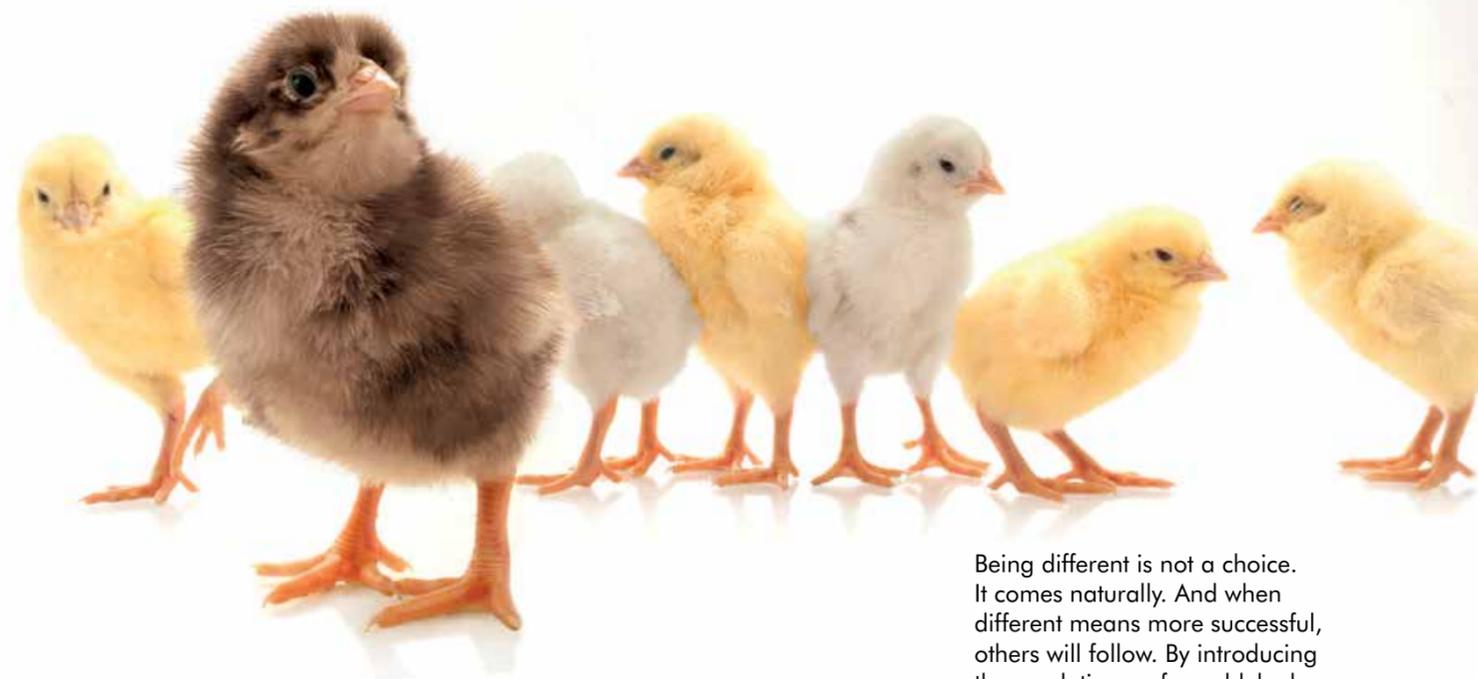
New jobs if EU-wide renovation project is implemented

€39bn

Yearly benefits to public finance under such an initiative

Naturally different

the next generation of insulation



Being different is not a choice. It comes naturally. And when different means more successful, others will follow. By introducing the revolutionary formaldehyde-free binder ECOSE® Technology, Knauf Insulation has successfully delivered one of the most significant innovations in the insulation industry in the last 20 years. No wonder others are trying to get a piece of the action. That is alright with us. ECOSE® Technology is still the only mineral wool binder based on rapidly renewable materials instead of petro-based chemicals. It means our glass mineral wool is odourless, easy to cut and remarkably softer to the touch, making it easier to install. Friendly on the hands and friendly on the environment. And yes, it's brown. Naturally.

www.knaufinsulation.com



KNAUFINSULATION
it's time to save energy

with **ECOSE®**
TECHNOLOGY

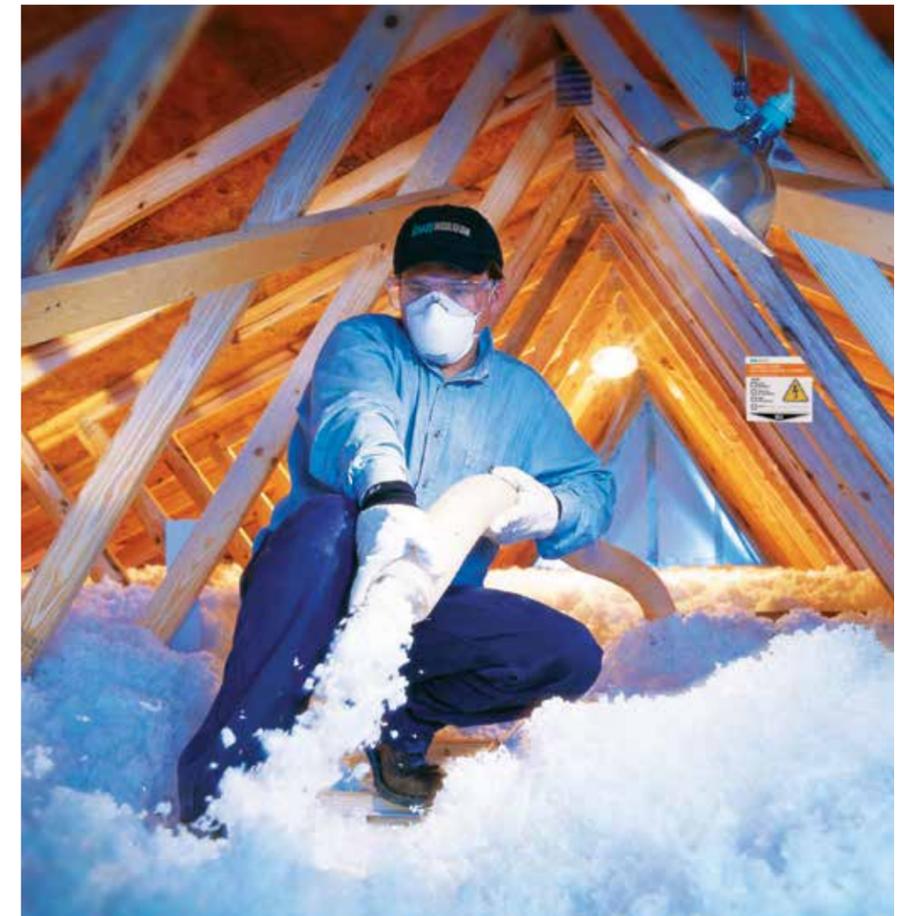


SPACE MISSION

Energy-draining homes come in all shapes and sizes, but Knauf Insulation's Blowing Wool range offers the ideal solution for every building. SUPAFIL, part of our professional Blowing Wool range, is non-intrusive for the homeowner and designed to save installers time and effort.



SUPAFIL being installed at a home in Spain through the outside, meaning minimum disturbance to the homeowners.



SUPAFIL can fill hard to reach loft space.

Putting the regulatory framework in place is one challenge, the next is physically renovating the existing building stock. It's not going to be easy. The state of the building stock is complicated: not only are buildings built differently around the world, even inside the same country houses have different construction methods, built during different periods, with different technologies and according to different building codes. And as we start to try to go back and renovate houses to a higher level of efficiency, we are uncovering problems we never knew existed. Through our research of the building stock in the UK, for example, we found that the void between two terrace houses, which was thought to be an insulating divide, in fact lead to convection heat loss. These voids now need to be filled. Accessing and filling such voids, empty cavities and hard to reach loft areas is not easy. Traditional methods have been invasive, messy and time-consuming to such an extent that they put most people off renovating.

By developing SUPAFIL, our specially designed virgin (binder-free) blown glass wool insulation solution, Knauf Insulation can fill the most inaccessible spaces with high quality insulation quickly and efficiently with little or no disturbance to the building. SUPAFIL is a bespoke Glass Wool product designed to be practical and efficient for installers and convenient for home owners. Furthermore, testing and certification show that SUPAFIL features a high acoustic performance and an A1 Euroclass level fire resistance. SUPAFIL is durable, lasting as long as the building itself and

in the UK, Belgium and the Netherlands SUPAFIL comes with a 25-year guarantee that is fully certified by a number of well-known building authorities such as BBA and Komo. And all these benefits have not come at a sacrifice to the strong environmental characteristics of Knauf Insulation products. SUPAFIL is the first blown insulation to meet the Lambda 90/90 requirement, offering homeowners the assurance of real performance. SUPAFIL also achieves Eurofins Indoor Air Quality 'Gold' (EU), 'A+' Glass Mineral Wool from the BRE Green Guide rating (UK), 'A+' for indoor air emissions (France), as well as Blue Angel (Germany). What's more, SUPAFIL is manufactured using up to 60% recycled glass.

In Spain, SUPAFIL is helping homeowners fill their cavity walls through the outside of their homes, overcoming the issue of the invasiveness of renovation, which was previously deterring renovation in Spain. SUPAFIL is also increasingly popular amongst installers in France, due to the ease and speed of installation, particularly for hard to reach lofts as well as timber frame constructions. "The RT 2012 is an extremely challenging thermal requirement for buildings here in France that we are beginning to see being implemented. Builders have never had to reach this level of efficiency before and in times of economic crises, time is money," says Jean-Jacques Pontailier, Managing Director for Knauf Insulation France. "SUPAFIL has all the characteristics of high performing insulation, but the fact that you can insulate a whole house in as little as two days is very attractive." ■

Cool idea for desert living

FACTS ABOUT BIRDSVILLE

Population: 120

Max temp: 49°C

Min temp: 0°C

Brisbane to Birdsville: 1,585km

Adelaide to Birdsville: 1,207km

Summers in Australia's most isolated town, Birdsville, can be brutal. Temperatures top 49°C and this means rubber soles can melt on the pavement, car wipers stick to windscreens and make-up melts from women's faces.

Last summer for 29 consecutive days it was 40°C or more in Birdsville and Australian weathermen were forced to invent a new colour for temperature charts as the heat was predicted to break record temperatures.

But now things have definitely become more comfortable as a result of a community project undertaken by Knauf Insulation. To demonstrate how effective insulation is at keeping buildings comfortable from climatic extremes and reduce energy costs, Knauf Insulation supported a DIY initiative to install more than 8,000 square metres of its new generation of high performance Earthwool insulation - enough to cover a football pitch - across every building in town.

Not only will the insulation dramatically reduce the town's energy needs but it will also keep the heat out of buildings in summer and keep the warmth in on cool winter mornings.

"What was life like before Knauf Insulation's initiative? We were resigned to another hot summer," says Birdsville resident and Tourism Manager Steven Baldwin. "Now we're really looking forward to seeing how insulation will change the level of comfort in our house."

"The real test will come in a few months when it starts to get warm but even with the current mild temperatures we can tell it's going to be more comfortable this year. We're particularly looking forward to the change in our small rooms such as bathrooms and laundry which are not covered by air-conditioning."

Baldwin says he was 'aghast' to discover there was no insulation in his home to start with. "If it wasn't for the Knauf project we would not have realised the benefits of insulating." Knauf Insulation initiated the project to restore confidence in DIY insulation following the disastrous impact of the Australian Government's early termination of its A\$2.5 billion Home Insulation Programme (HIP). Abandoning the HIP scheme means many homeowners will continue to incur high bills as well as uncomfortable winters and summers. "Electricity prices have risen by 70% in the past five years and there are currently more than a million Australian homes without any insulation," said Stuart Dunbar, General Manager Australia and New Zealand at Knauf Insulation. "Studies have shown that ceiling insulation alone could save the average home about A\$299 in annual energy costs." ■



Campaigning for change

Around the world at every level – from policymakers to homemakers – Knauf Insulation is dedicated to keeping the issue of energy-efficient renovation centre stage.

UNITED KINGDOM

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 breath life into the concept including linking house stamp duty - a house sales tax - to a property's energy efficiency rating
More info? www.knaufinsulation.co.uk

FRANCE

What? New coalition for energy efficiency
How? A group of non-government organisations, homeowners' associations, environmental groups and businesses including Knauf Insulation aim to help the government deliver the French government's plan of refitting 500,000 homes a year.

SPAIN

What? Easy insulation
How? In Spain, the company's Blowing Wool is installed via an external wall meaning minimal disturbance for homeowners and maximum ease of installation, factors that encourage people to take up energy-efficient renovation. "It's our job to make the process as easy as possible," says Knauf Insulation's Alberto de Luca, General Manager, Spain and Portugal.
More info? www.knaufinsulation.es

BELGIUM

What? Belgian Cavity Wall Campaign
How? Flemish Energy Minister Freya Van den Bossche underlined the importance of cavity wall insulation with a press conference demonstration of Knauf Insulation Supafil installation. A total of 12,000 houses received cavity wall insulation subsidies in Flanders in 2012 and return on investment is estimated to be less than four years. During 'Open Cavity Insulation Day' on June 22, Knauf Insulation Superfil installers demonstrated insulating homes around the Flemish provinces.

UNITED STATES

What? Saving homeowners' money and energy
How? Currently being piloted as the Energy Response Corps in the US and Energy Response Force in the UK, these teams are helping identify the simple money and energy-saving changes required to help homeowners 'start winning and stop losing'
More info? www.energyresponsecorps.org

EUROPE

What? Improving fire safety
How? As part of Fire Safe Europe, Knauf Insulation plays a role in driving awareness of the challenges related to fire safety. As the built environment changes, Knauf Insulation believes it is crucial to pick the right products for every renovation situation and not make choices that could increase building fire risk.
More info? www.firesafeeurope.eu

EUROPE

What? Helping countries find funds
How? Knauf Insulation has been working with the European Bank for Reconstruction and Development (EBRD) to put in place a renovation fund in Slovenia.

EUROPE

What? Finance Task Force
How? Knauf Insulation has brought together an internal team to better understand the challenge of finance for renovation.

SLOVAKIA

What? New alliance for energy retrofits
How? Knauf Insulation in Slovakia initiated a new alliance called Buildings for the Future to promote policies for energy retrofits with the Association of Construction Entrepreneurs, the Slovak Green Building Council, the Association for Building Renovations, the Institute for Energy Passive Houses and Greenpeace. The alliance is providing the government with advice on financial mechanisms for thermal renovation and assistance in development of the Renovation Roadmap within EED implementation.

CZECH REPUBLIC

What? Around €40 million
How? Knauf Insulation with local partners worked hard to support government to create a law to drive money from the emissions trading system (ETS) to an energy-efficient renovation initiative. €40million was obtained but the government is looking to unlock more money.

GERMANY

What? Unlocking money for renovation
How? Heightening public awareness of the importance of renovation through, for example, the German Business Initiative for Energy Efficiency (DENEFF) of which Knauf Insulation is a key member. In 2013, EU Energy Commissioner Günther Oettinger called for a fresh impetus for building renovation at a DENEFF conference.

NEW ZEALAND

What? Improving building expertise
How? Knauf Insulation has become a member of the organisation Homestar, a non-profit started by New Zealand's Green Building Council and Branz. Homestar curates expertise from the building industry to make homes "better to live in, better for the planet and better value in the market"
More info? www.homestar.org.nz

GLOBAL

What? Better data
How? The company is bringing together expertise to improve analysis of energy efficiency measures in buildings. "We are committed to closing the gap between design and real performance," said Knauf Insulation's Frederique Delcuve, Head of Building Science. "Everyone in construction has a duty to get buildings right."

AUSTRALIA

What? Insulating Australia's most isolated town
How? By transporting 8,000 square metres of EarthWool insulation 1,500km across the outback to be installed in every building in the town of Birdsville (population 120). For 29 consecutive days last summer, temperatures were 40°C or more in Birdsville, the insulation will make a major difference to keeping the heat out in summer and the warmth in during winter.



The striking Main Point Karlin used Knauf Insulation products in its construction and is LEED Platinum rated

The shape of things to come

The green construction industry is moving fast with a growing trend for building sustainability rating tools.

There are the organic curves and muted tones of the award-winning Main Point Karlin; the extensively renovated celebration of 1970s design, the Qubix and the glacial façade of the City Green Court. All three buildings have been awarded LEED Platinum certificates in the past year. Also in the Czech Republic, the soaring facades of the Spielberk Tower punctuate the skyline of the city of Brno. Spielberk is the first building outside of the UK that has achieved BREEAM Outstanding rating; each of these buildings used Knauf Insulation Glass or Rock Mineral Wool during their construction, but the fact that they all achieved high assessment ratings underlines a significant commonality; the trend for sustainable building certification by ratings organisations such as LEED, BREEAM, DGNB and or HQE is growing rapidly.

Research by real estate company IVG revealed that from 2011 to 2013 the number of LEED certificates tripled from 99 to 296; the number of BREEAM certifications soared from 725 to 2,947; DGNB certificates went from 61 to 402 and HQE increased by 395 to 981. Owners of green buildings are increasingly able to charge a premium to tenants and use certification as a market differentiator. Many international tenants also want to lease rated buildings because the running costs are lower. As a producer of energy efficient systems for buildings, we have a role in understanding this trend, as well as providing the solutions to help make buildings more sustainable. ■

Rating the ratings

Knauf Insulation has an internal Task Force for Green Buildings. Ondrej Sramek, who chairs the Task Force, discusses the future of sustainable building assessment initiatives, their impact on the green construction industry and how Knauf Insulation can help.



The BB Centrum in Prague rated 'good' by BREEAM

❓ Initiatives such as LEED, BREEAM and DGNB are effectively competing. Will one overall 'winning' ratings tool emerge in the future?

▲ This is a tricky question. Competition among rating tools is good for the market in that it pushes operators to improve their tools. So, for instance, we see that LEED which is popular in the US now adopts more and more 'Alternative Compliance Paths' that allow builders outside of America to achieve credits in a more locally specific and meaningful way. Similar development is happening in BREEAM and there are even talks about recognising some credits between these two systems. LEED and BREEAM however are quite similar, while systems like DGNB are substantially different, so harmonisation there would be much more complicated.

❓ So there is no global initiative planned?

▲ At global level I am not sure we will ever be able to reach a common standard, particularly as sustainability has a different focus depending on where you are. It is true that some developers have their buildings certified with several rating tools to increase their competitiveness and this would indicate harmonisation is needed. But all these systems are based on multi-criteria assessment, which

means benchmarks and weightings are applied to different categories. Even if agreed by scientific committees, these are arbitrary and different in different regions and countries. This makes global harmonisation very difficult, if not impossible. We believe it would be useful to at least try and agree a common set of indicators and methodologies for everyone, but the weighing and benchmarks need to be allowed to reflect local and regional priorities.

❓ To what extent are governments looking at making these kinds of initiatives mandatory in the future?

▲ The European Commission has been gathering views and information in its Consultation on Sustainable Buildings. Directives that focus on energy efficiency have already been introduced and the discussion has now been widened to look at elements such as resource use, environmental impacts and the life-cycle of buildings. The outcome from this consultation will be interesting and obviously Knauf Insulation is contributing extensively to this discussion.

❓ Is there a need for such regulation in the commercial sector?

▲ I think it is in the commercial real estate segment where

IN NUMBERS:

300%

Increase in LEED certificates from 2011 to 2013

2,947

Number of BREEAM certificates in 2013 up from 2011's 725



The BREEAM-certified Spielberk Tower (left) and the platinum-LEED Qubix building



we see the most dynamic green building trends but at the same time we are still a long way from having all commercial buildings covered by a sustainability assessment. So, in my view it is important that we don't undermine the current existing market-based rating tools but at the same time we should look at ways to ensure all new commercial buildings are as sustainable as possible.

❓ What about the residential sector?

▲ Similarly as we have minimum energy performance requirements today, we should probably have some minimum requirements for other areas of sustainable construction such as indoor air quality, water and waste management, sustainable use of building materials and so on. Ideally all these requirements would have some common logic. We need a balanced approach, which would not be too costly for households but would make a

meaningful contribution to future sustainability.

❓ How important are criteria other than energy efficiency for Knauf Insulation?

▲ We are primarily still an insulation manufacturer, so our key focus is saving energy. But all the other benefits of good insulation are also important in sustainable buildings: acoustic performance helps improve work productivity and indoor air quality while fire resistance increases a building's safety. Improving our manufacturing processes can contribute to low embodied energy and other environmental impacts. But we are also entering completely new areas that go beyond an individual building. For instance with our solutions for green roofs we can help reduce heat island effect in urban planning or improve storm water management which helps the municipal sewer systems. That's why it's so exciting to explore green buildings.

❓ To what extent does Knauf Insulation contribute to green building trends?

▲ We consider ourselves an active supporter of green buildings. We do a lot through our Brussels based trade Associations like EURIMA, the European Insulation Manufacturers Association and we are a member of many Green Building Councils (GBCs) around the world, some of which we helped establish. In May 2013, for example, we took part in the first briefing of the Ukrainian Green Building Council (UaGBC) that aims to bring together Ukrainian expertise to promote standards of sustainability, organise trainings and develop the eco-friendly materials market.

❓ How else does Knauf Insulation support Green Building Councils?

▲ We support the European Regional Network of GBCs, where individual councils come together and cooperate on issues of common interest, but we also respect the bottom-up structure of the network. Each GBC is different and comes from different local conditions. Some are based around one specific rating tool, some are neutral and promote sustainable construction regardless of rating tool. To better understand this diversity we set up an internal task force composed of people at Knauf Insulation who deal with GBCs in their respective countries. Just by bringing these people together we have already started learning a lot of new things. ■

HOW ROBUST IS CERTIFICATION?

EkoWATT's Petr Vogel: "The beauty of certification systems is that they make investors think about aspects they would normally not think about as much. They achieve it by mixing together credits awarded for concrete business benefits with credits that prize wider societal benefits. The investors always consider the former, but now, since they want to achieve a good overall rating, they also focus on the latter.

"A key question that often follows is, but how robust are the systems? Obviously, the more robust and rigorous system you have, the stronger the rating it gives. But complexity comes at a price and if a system is too costly, it tends to be used less, reducing its overall impact. Look at the debate between LEED and DGNB.

"LEED is often criticised for too much simplicity, but it undoubtedly has some drive. DGNB is definitely more complex and robust, but also costs twice as much. It's good to have competition, because every investor can choose which way to go and eventually we end up with better buildings.

"So what makes a good rating tool? It must facilitate integrated design and proper design in general. But it doesn't stop there. It also has to have a strong commissioning part, i.e. checking that what's on paper is also built in reality. Aside from this it also needs to look at the construction site itself, not only the resulting buildings. And finally, it should involve some real measuring after the building has been built to ensure real performance and the possibility to improve."

WHAT IS A GREEN BUILDING AND HOW DO KNAUF INSULATION'S SOLUTIONS CONTRIBUTE?

A GREEN BUILDING...	HOW KNAUF INSULATION CONTRIBUTES
<p>TAKES AN INTELLIGENT APPROACH TO ENERGY</p> <ul style="list-style-type: none"> Minimising energy use in all stages of a building's life-cycle, making new and renovated buildings more comfortable, less expensive to run and helping building users learn to be efficient too. Integrating renewable and low-carbon technologies to supply buildings' energy needs, once design has maximised inbuilt and natural efficiencies. 	<p>Our products reduce building thermal energy by up to 80% and our Glass Mineral Wool product can save more than 500 times the energy used in its manufacture. Regarding low carbon technologies, we supply to leading European flat thermal solar collector producers. Owing to its thermal insulation properties, high temperature stability and low-organic compound emissions our rock and glass mineral wools are an integral part of flat thermal solar collectors.</p>
<p>SAFEGUARDS OUR WATER RESOURCES</p> <ul style="list-style-type: none"> Exploring ways to improve drinking and wastewater efficiency and management, harvesting water for safe indoor use in innovative ways and generally minimising water use in the sector. Considering the impact of the built environment on drainage ensuring it is not put under stress. 	<p>Our Urbanscape green roof solution is an innovative and easy-to-install system with high water retention capacity designed specifically for green roofs as well as landscaping areas such as residential gardens, golf courses, commercial spaces, cemeteries and public parks. A major advantage of green roofs is that a reduction of storm water run off also decreases the burden on sewer systems by between 70-90% in the summer</p>
<p>MINIMISES WASTE AND MAXIMISES REUSE</p> <ul style="list-style-type: none"> Using fewer, more durable materials and generating less waste, as well as accounting for a building's end of life stage by designing for demolition waste recovery and reuse. Engaging building users in reuse and recycling. 	<p>Through life-cycle assessment we better understand the impacts of manufacturing our products and can manage these impacts by substituting for more durable, readily renewable, lower-impact materials. Regarding the waste we produce through manufacturing, we have achieved zero waste to landfill in our Northern Europe manufacturing sites. Knauf Insulation has also piloted a take-back initiative of pallets.</p>
<p>PROMOTES HEALTH AND WELL-BEING</p> <ul style="list-style-type: none"> Delivering high indoor air quality, avoiding materials that create harmful emissions while incorporating natural light to ensure users' comfort while cutting lighting energy. Utilising proper acoustics and sound insulation that play a key role in the comfort and enjoyment of a property. Ensuring people are comfortable in their everyday environments by creating the right indoor temperature. 	<p>ECOSE® Technology is a revolutionary, formaldehyde-free binder technology, based on rapidly renewable materials instead of petro-based chemicals. It reduces embodied energy and delivers superior environmental sustainability. Buildings play an important role in terms of air quality; the energy used to heat and cool buildings creates air pollution and people spend most of their time indoors. More energy efficient buildings mean less air pollution being produced from and because of buildings.</p>
<p>KEEPS OUR LANDSCAPE GREEN</p> <ul style="list-style-type: none"> Recognising that our urban environment should preserve nature, ensuring diverse wildlife and land quality are protected or enhanced, for example by remediating and building on polluted land or creating green spaces. Looking for ways we can make our urban areas more productive, bringing agriculture into our cities. 	<p>The landscaping industry is evolving to ensure improved plant growth, environmental stress resistance and soil erosion control. The sustainable aspect of landscaping solutions related to water conservation is also important. Water-saving capability is one of the main advantages of our Urbanscape Landscaping System. Urbanscape substrates are made from rock mixtures that are available in nature. The lightweight open structure of products promotes extensive root distribution and plant growth.</p>
<p>CREATES RESILIENT AND FLEXIBLE STRUCTURES</p> <ul style="list-style-type: none"> Adapting to a changing environment, ensuring resilience to events such as flooding, earthquakes or fires so that buildings stand the test of time and keep people safe. Designing flexible and dynamic spaces, anticipating changes in their use over time and avoiding the need to demolish and rebuild or significantly renovate buildings to prevent them becoming obsolete. 	<p>The time it takes for a fire in a building to turn into a full blaze has fallen from 25 minutes in the 1950s to about 3 minutes today. The driver behind this is understood to be the increased amount of combustible material in our homes and buildings. That is why it is crucial to pick the right products for every application and not make choices that could increase building fire risk. Knauf Insulation manufactures and distributes a wide range of products especially suited to fire protection applications.</p>
<p>CONNECTS US</p> <ul style="list-style-type: none"> Creating environments that connect and enhance communities, such as reducing the stress of transport on the environment. 	<p>While our products cannot directly influence this aspect of green buildings, they can be used in infrastructure development.</p>
<p>CONSIDERS ALL STAGES OF A BUILDING'S LIFE-CYCLE</p> <ul style="list-style-type: none"> Lowering all environmental impacts over a building's life-cycle through design, construction, operation and demolition and considering all embodied resources - the invisible resources used in buildings such as energy to transport materials. 	<p>While continuing to contribute to the reduction of the environmental impact of the use phase of buildings through improved energy performance we, as a construction material manufacturer, are working to reduce the impact the construction and end of life phases.</p>

Green Building Councils are non-profit organisations aimed at transforming buildings, communities and users' behaviour towards sustainability. The Europe Regional Network (ERN) consists of more than 30 national Green Building Councils and Knauf Insulation is one of the ERN's regional partners. Below are the ERN's eight key elements of a green building and the ways in which Knauf Insulation can contribute.

CASE IN POINT
<p>In a recent renovation of a terraced Victorian house in the UK, the owners were able to improve the thermal performance of the property by almost 80% through a combination of Knauf Insulation solutions. The overall refurbishment resulted in a reduction in carbon emissions from the house by 1.07 tonnes per annum and financial savings through reduced energy bills of £235 per year.</p>
<p>An Urbanscape Green Roof System using two-centimetre Urbanscape growing media was recently installed in a residence in the Dutch town of Honselersdijk. The system provides good storm water management, reduces CO₂, offers excellent sound insulation, extends the life expectancy of the roof and inevitably provides a great energy saving performance. It looks good too.</p>
<p>Through LCA we saw binder in our Wood Wool had an impact on global warming potential, 'abiotic depletion potential' (which measures resource extraction) as well as on non-renewable energy. So, we are substituting our binder to reduce negative environmental impact. This has also had a positive impact on other indicators, so there is no burden shifting.</p>
<p>Knauf Insulation has consistently achieved internationally recognised high standards of certification for its products including: Indoor Air Comfort Gold (Eurofins) for Glass Mineral Wool; Blue Angel in Germany for Wood Wool and Glass Mineral Wool as well as the French product emissions labelling regulation A+ for Glass Mineral Wool and B for Rock Mineral Wool.</p>
<p>An Urbanscape Modular Green Roof System with a four-centimetre Urbanscape growing media has been installed in a car park roof in the Slovenian town of Škofja Loka. Green roofs such as this can capture airborne particles including smog, cut CO₂, provide a mini eco-habitat, reduce storm drainage runoff that can place a burden on sewerage systems and they are more attractive than acres of concrete.</p>
<p>Our unfaced mineral wool products achieve A1 Euroclass for fire reaction. Knauf Insulation's Heraklith® range offers multilayer boards with minimal combustibility, as well as non-combustible boards (both A2 class). They do not melt or produce burning droplets, and are rated best in class in terms of smoke. Our new DRS FIRE BOARD 2D & 3D, meanwhile, are supreme fire-resistant cores for doors.</p>
<p>Acoustic highway barrier from Heraklith in Poland.</p>
<p>Our recent life-cycle assessment tool enables us to characterise all our product environmental impact. Knauf Insulation is the first in its industry to produce software that will make LCAs available within a few clicks.</p>



Most popular green building ratings initiatives

Quick guide to Green Building Assessment initiatives

BREEAM

BREEAM or Building Research Establishment Environmental Assessment Method started in the UK in 1990 where it is now a voluntary initiative in the private sector and compulsory in the public sector. Points are awarded in line with sustainable approaches to energy and water use, internal environment, pollution, transport, materials, waste, ecology, management processes and the life-cycle of buildings. A total of 109 credits are available of which less than 30 is a fail, a 'good' is 45, very good 55, excellent 70 and outstanding over 85.

LEED

LEED or Leadership in Energy and Environmental Design started in 1993 in the US and is now popular worldwide as well as in North America. It covers new, existing, commercial and residential property and is concerned with energy, atmosphere, water efficiency, materials, resources and indoor environmental quality. There are a hundred points to achieve. To be certified you need 40-49, to get silver 50-59, gold is 60-79 and platinum is 80 points and over.

HQE

HQE or Haute Qualité Environnementale (High Quality Standard) is a French initiative that started in 1996. Not as widely adopted as LEED or BREEAM, HQE is still committed to common aims including reducing energy and water use, minimal environmental impact on surroundings, a healthy internal environment and the full life-cycle of a building. It covers new and existing buildings from commercial properties to multi-family housing.

DGNB

The Certification System by DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen or German Sustainable Building Council) was founded in 2008 and focuses on around 50 criteria ranging from environmental, economic, technological and work process aspects to sociocultural and functional dimensions. "A holistic approach is taken" meaning the system assesses the entire lifecycle of the building. Buildings are awarded DGNB certificates in bronze, silver or gold. In addition, there is the option of simple pre-certification in the planning phase.



Your world is changing

— we're here to help

There is nothing more certain than change. Especially when it comes to regulation that governs the built environment. Fortunately, there is another certainty as well. From green roofs and thermal efficiency to fire safety and industrial regulation, Knauf Insulation is always one step ahead helping support these changes by creating the products and solutions that customers want today and may be legally required tomorrow.

One of the most effective ways to change the future for the better is to make buildings more energy efficient. That's why the company is working hard with partner organisations and policy makers to ensure that the right policy framework is in place to drive change. The Recast of the Energy Performance of Buildings Directive (which set minimum efficiency standards for residential and commercial buildings) and the recent European Energy Efficiency Directive (requiring Member States to produce roadmaps for renovation by April 2014) are examples where these collaborations have taken place.

Knauf Insulation is also collaborating with partners to lobby for legally binding energy savings across Europe by 2030. All these regulations that Knauf Insulation is pushing for, are going to change the world construction industry as we know it. Be it builders or specifiers, architects or installers, ever tightening regulation is on the horizon.

That horizon need not seem so bleak. Knauf Insulation is working hard to ensure that its customers have the products and materials they need to benefit from regulatory standards now and in the future. The construction manufacturers that understand the changes coming in the political landscape will therefore be ready to provide for the changing needs of their customers.

GETTING TO LOW- AND ZERO-ENERGY BUILDINGS

Government regulation is putting a serious squeeze on thermal inefficiency in new European buildings between now and 2020.

Whether new build or renovated, buildings are going to have to be seriously energy efficient. And it's a necessity that brings great opportunities as well as endless technical challenges. ►

Green roofs create a tranquil oasis of space in Monte Carlo, Monaco

For example, many old buildings have been constructed with inherent flaws such as cavity walls, huge energy-inefficient spaces that need to be filled. Then there is the issue of new buildings. Each building is constructed to meet the demands of its environment, so there is no one-size-fits-all solution.

Of course new-builds can avoid the mistakes of the past but there will still be challenges as energy efficiency increases until buildings are near zero-energy, a standard that will be mandatory in all new European buildings by 2020.

One of the key challenges that drains energy from buildings is poor air-tightness. Tackling this issue while adding insulation can achieve great levels of energy efficiency.

Knauf Insulation has developed a system known as ECOSEAL in the States and Homeseal in Europe. The system combines the best insulation for a building with Quickseal a flexible sealant that easily and efficiently closes energy-depleting building gaps.

Quickseal combined with Knauf Insulation's SUPAFIL blowing wool or Glass Mineral Wool with ECOSE Technology is ideal for renovations and for ensuring airtight, insulated homes.

GROWING DEMAND FOR GREEN ROOFS

Green roofs transform buildings, bring nature to cityscapes and are beautiful to experience, particularly when they are transformed into park spaces, urban playgrounds or even farms.

But perhaps the best news of all is that they are great insulators, saving building energy - 25% for heating and 75% for cooling. They also cut flooding by absorbing rainwater, reduce strain on sewer systems and have a positive impact on Urban Heat Island Effect, where city buildings are much hotter than those in the countryside.

Green roofs absorb 5kg of CO₂ every year and, even better, can provide homes for wildlife.

IN NUMBERS:

2,000m²

Minimum building space that requires a green roof in Toronto

5kg

Annual amount of CO₂/m² that can be absorbed by a green roof



Above and beyond: Knauf Insulation has unveiled a new range of green roof solutions



New buildings in Europe will have to be near zero-energy by 2020

They can also improve property values (least of all because they extend the life of traditional roofs below all that grass). So, green roofs are good. But in some parts of the world they have also become the law.

Take Toronto, for example. Here green roofs are now required on all new buildings with a minimum gross floor space of 2,000m² (with the exception of residential buildings less than six storeys).

In Copenhagen, all new roofs with a pitch under 30 degrees have to be landscaped, while in Singapore the city aims to achieve 50 hectares of new 'Skyrise Greenery Areas' by 2030.

In Linz (Austria), Basel (Switzerland), Seattle (US) and Munich (Germany) there have also been incentives to create green roofs for years including grants, reduced

storm water fees and urban regulations. The trend is clear. A green roof requirement could spring up at any moment.

Knauf Insulation recently launched its own range of green roof systems. Known as Urbanscape they come in two different versions 'extensive' green roofs of 8-10 cm and 'intensive' green roofs of 15cm or more.

These are the technical specifications, but their scope is only limited by the imagination of the person who installs them.

Green roofs go beyond the meaning of contemporary architecture and give a new value to the role of buildings within urban planning. They are designed not only to bring back the natural element in the urban environment but also to provide solutions for important issues such Urban Heat Island Effect and stormwater management. ►

One of the key challenges that drains energy from buildings is poor air-tightness. Tackling this while adding insulation can achieve great levels of energy efficiency.



MAKING INDUSTRY EFFICIENT AND PRODUCTIVE

In the US the Energy Savings and Industrial Competitiveness Act is working its way through the legislative process with the aim of slashing energy waste and boosting productivity through better technology and energy-saving practices.

In Europe carbon credits are bought and sold by industry under the Emissions Trading Scheme. Then of course there are the energy audits that industry will have to carry out under the EU's Energy Efficiency Directive.

The industrial regulation landscape is changing fast and energy efficiency is getting to the top of the agenda.

The best answer to all these changes is not complicated: simply insulate.

It saves energy, money, the environment and it strengthens competitiveness.

Imagine an investment that pays back in two months! A report commissioned by the European Industrial Insulation Foundation (EiIF), of which Knauf Insulation is a member, examined several real-life examples in various industries and countries.

For a chemical plant in France, the payback was between two and four months with energy savings of 12,600,000 kWh/a and financial savings of over €505,000pa.

In a refinery in Italy, the payback was between one and three years providing energy savings of 1,021,958 kWh/a and financial savings of €75,000pa.

Installing cost effective insulation across EU industry requires an investment of €7 billion but will represent savings of 620PJ or €5.5 billion every year from reduced heat loss.

Knauf Insulation Technical Solutions has the right products for every industrial insulation challenge, from non-combustible wired and lamella mats, to fire-proof pipe sections, high temperature and tank boards, and binder-free loose wool and flocks.

IMPROVED BUILDINGS, IMPROVED FIRE SAFETY

Knauf Insulation offers a wide range of A1 and A2 fire-safe insulation products for every building requirement from ThermoShell and ETICS rock-based systems to Glass Mineral Wool with ECOSEAL Technology to Heraklith and Rock Mineral Wool Slabs.

But it is not enough to offer fire-safe solutions. Knauf Insulation believes it also needs to tackle key issues at the heart of fire safety regulations.

By working with organisations such as Fire Safe Europe and a wide range of construction experts and industry partners, Knauf Insulation aims to highlight dangerous discrepancies in fire safety regulations across Europe with policy-makers.

Knauf Insulation has also supported research into the impact that new thermal building regulations are having on safety and has raised concerns that testing protocols are not as robust as they should be. The company believes they should be improved to reflect the impact of real fire performance.

As the built environment changes, new products and materials are installed and new innovative procedures are showcased, particularly in the light of new energy-saving regulations, Knauf Insulation believes it is critical that the decisions taken to improve a building don't compromise its fire resistance. ■

THE LINE HAS BEEN DRAWN.



It's thin, it's blue, and it's your best option for energy-efficient homes.

Introducing Knauf Insulation EcoSeal™ Water-Based Elastomeric Sealant.

New EcoSeal forms a tight, flexible seal to prevent air infiltration in your project. And when you pair EcoSeal with our EcoBatt® or Knauf premium blowing insulation, you get exceptional thermal performance, simplicity and genuine sustainability. All for a fraction of the cost of traditional foamed-in-place products.



Become an EcoSeal Qualified Installer today. Go to www.knaufinsulation.us and click the EcoSeal banner, or simply scan the QR code to the left with your smartphone.

ECOSEAL™
KNAUF INSULATION
it's time to save energy



PIONEERING PRODUCT SUSTAINABILITY

Amidst the confusion of information declaring to prove environmental performance, Knauf Insulation is striving to provide customers with the right type of information, in a way that's understandable.

Once upon a time, in the Dark Ages of green construction, sticking a label on a product and saying it was 'green' gave everyone a warm glow of feel-good satisfaction. The problem was, that label was very limited in meaning. The product market became cluttered with claims of being 'carbon neutral', 'recyclable' and 'environmentally friendly', but these claims were simply not enough (and in some cases downright deceptive).

Muddying the waters further, similar competing products carried different labels and used different methodologies to prove they were 'sustainable'.

Before you had time to say, 'greenwash' the world was facing an invasion of eco-labels claiming to prove a product was sustainable, but the majority were based on very little.

So how could you tell if a product was sustainable? Who knew?

Then galloping through the growing gloom of more and more confusion on product sustainability came the EPD (Environmental Product Declaration) making all those eco-labels with their unfounded promises seem like medieval history.

Why? Because by focusing on the environmental impact of a product across its entire life-cycle through Life-cycle Assessment (LCA) from raw material sourcing, manufacture, use and disposal, rather than simply one small element of a product's life (for example whether it contains recycled content) an EPD gives the entire sustainable 360° picture, not just a snapshot. ▶



If product sustainability could be boiled down to one indicator then a snapshot would be useful. But it can't. For example, we love to put high levels of recycled content in our Glass Mineral Wool because we use less energy to produce it and it removes glass bottle waste from landfill. But increasing our level of recycled glass increases slightly our emissions of SOx.

There are 24 indicators in an LCA (according to the EN 15804 standard) that quantify the environmental impact of a product and through LCA we understand we can make great reductions on almost all the other indicators, at the sacrifice of a small rise in SOx. If you only looked at SOx, you'd think this was a bad thing. But holistically, the green credentials of our GMW with higher levels of recycled content are much better than GMW made with virgin sand. Product sustainability is therefore about choosing relevant indicators to compare as well as ensuring you are comparing equivalent products in the first place.

EPDs are complex and preparing them is time consuming. As little as five years ago, there were only a few available on the market. Today, there are a few thousand. But there are hundreds of thousands of products.

"There is almost no doubt in my mind that, in the future, all construction products will need to be characterised by a LCA, with results communicated under an EPD format," says Vincent Briard, Head of Sustainability - Products and Buildings at Knauf Insulation and a member of the internal Green Building Task Force. "The market is slowly starting to understand how to use information on product sustainability - the trouble is how to get such complex information to the market, which is what we're working hard on."

DISTILLING THE ESSENCE OF ENVIRONMENTAL IMPACT

Knauf Insulation is focusing efforts on providing the necessary information in an understandable format through its LCA programme. Our first step has been to develop a tool based on LCA results that allows us to provide information on the key environmental characteristics of any products.

This tool, our EFS - Environmental Fact Sheet - is already available for all our Wood Wool products and we are in the process of making EFS available for other products as well. Focusing on key information, our EFS is only three pages long, compared to common EPDs on the market that can range from six to 30 pages. This is an innovative step that Knauf Insulation has taken to help serve the market with information on green credentials.

"We started with the EFS for our Wood Wool products. It has meant we could produce hundreds of EFSs in half the time it would take to produce a single EPD, while still providing important information on product sustainability," says Joachim Wieltschnig Technical Director for Wood Wool.

In parallel, Knauf Insulation has begun the next step of its programme, to develop a system that will be able to provide pre-verified EPDs upon request starting with our Mineral Wool products. By pre-verifying much of the EPD process, the time needed to verify will be minimal and so will help us produce fully verified EPDs upon request. This is a massive improvement on the current process involved in producing an EPD, which can be complicated, costly and time-consuming.

We're not stopping there. In 2014, we will connect this

KNAUF INSULATION'S LCA PROGRAMME IN A NUTSHELL

Our LCA Programme has helped us understand and better manage our environmental impact as well as communicate product information to the market.

Helping 'redesign' our products:

- The blowing agent in our XPS has been replaced with a gas with significantly less impact while still maintaining thermal performance.
- We have significantly reduced the environmental impact of our Wood Wool in terms of GWP (global warming potential), energy and negative impact on resource use through the substitution of an ingredient in the current binder.
- Proving the benefits of our other manufacturing programmes, such as energy reduction and higher levels of recycled content for GMW.

Helping provide the market with the information it needs:

- Production of our EFS - providing information on key indicators.
- Development of our pre-verified EPD



system with our online data collection across all our manufacturing plants, meaning we will be able to provide the next generation of information on the environmental footprint of our products, based on the most up-to-date data.

Information on product performance is important because it is necessary in understanding building sustainability. When you start trying to calculate the sustainability of a building, not only do you need to consider the environmental performance of each product going into it, but you must also calculate how they work in combination as a system.

Combining the impact of these construction systems and that of all other life-cycle phases of the building is a complex business as it requires, amongst other information, the LCA data from every product as well as a modelling software to

calculate the total building environmental footprint from an holistic approach.

THE BETTER OUR PRODUCTS THE BETTER THE BUILDING

Buildings design software such as BIM (Building Information Modelling) is starting to calculate the environmental footprint of buildings. Bringing all this data together will not be easy but this is where the increased use of BIM is already starting to play a role. "At Skanska we see BIM as a key element to helping us deliver sustainable and cost effective buildings. If today we are using BIM more and more, tomorrow a majority of our projects will use BIM,

meaning that we will need all our suppliers to be ready to follow," explained Noel Morrin, Senior Vice President for Sustainability and Green Support at Skanska.

BIM is revolutionising the building chain, from design to installation and beyond by optimising all characteristics of a building in its design phase. BIM has been the evolution of the architect's previous software, CAD.

This modelling software started with the look and feel of a building, but now models the mechanical properties and more recently the thermal, acoustic and environmental impact of buildings.

This software is evolving and with the right information could even model the cost of the building or health related aspects. Building sustainability is going to rely on the accessibility of products information and clearly it won't be enough to claim high levels of recycled content; every construction product will need LCA information available in an EPD format.

Building rating schemes, such as HQE, DGNB and BREEAM are already linked to EPD databases, with product sustainability information feeding into the calculation of each green building certification initiative. Unlike the previous version, the new version of LEEDv4 from the US will give additional credits to products with EPDs. Not only can our tools inform customers, but it can help feed these databases with the information needed for these green building initiatives, not forgetting for BIM.

In the UK, we already have a comprehensive library of BIM Objects for our products (material objects) which is based strictly on the current UK COBie templates, as well as construction build ups (material layer sets). This BIM library is free and available in various formats such as Autodesk Revit, Graphisoft ArchiCAD, Bentley Microstation, Nemetschek Vectorworks and IFC (Industry Foundation Class). This state-of-the-art library of BIM materials meets both present and future requirements, something that not all product manufacturers can claim.

In 2009, Knauf Insulation North America created a library of BIM objects with ARCAT. These objects cover walls, ceiling, floors, and roofs.

These are genuinely exciting times for green construction.

The once upon a time of 'sustainable' labels or single definitions has been consigned to history, as archaic as drawing architect plans with a goose quill. Authentic in-depth, quantifiable information at the swipe of a computer is now the future and it's a future in which Knauf Insulation is playing a pioneering role. ■

THE GEEKY BIT

As the significance of the impact of the building 'use phase' diminishes with more energy efficient buildings the impact of the construction product is becoming more important. The total environmental impact is therefore beginning to fall more on the construction products going in to the building. What used to be only 8% of the relative environmental impact over the building life-cycle in 1995 will be 42% for construction materials for a similar building built in 2020.

WHAT DOES product sustainability MEAN TO YOU?

SUSTAINABILITY MEANS HIGH LEVEL OF RECYCLED CONTENT/RECYCLABILITY

Our Glass Mineral Wool boasts up to 82% recycled glass bottles. In the US, our level of recycled content is externally verified through UL Environment, who provide validations for environmental claims. As for our Rock Mineral Wool, we have levels of above 25% recycled content in the form of furnace slag recycling (waste from other industrial processes in metallurgy). Our foam insulation recycles almost 99% of the internal scrap and our Wood Wool is readily renewable. We love recycled content, so much so that in our Stupino plant, we've started gathering bottles from the local community, redirecting a waste source that would otherwise go to landfill. As for the recyclability of our products, this is down to the feasibility of sorting products in the deconstruction of the building. We're working on how our products can make that process smoother, but that involves predicting how we'll deconstruct buildings in 50 years plus. By moving to systems approach, we believe this aspect will be much easier to manage.

Recycled content is a good indication of a more sustainable product. But, if you really want to know about product sustainability, we believe that recycled content does not paint the full picture. At every stage, there are environmental impacts and managing those environmental impacts is really what being sustainable is all about. We understand and manage our impacts through Life Cycle Assessment. That life starts the minute the raw materials are sourced to create that product. Then, of course, that product has to be manufactured, packaged, transported, installed, used, removed and disposed of. Ask us for an EPD to find out more about the life-cycle of our products.

SUSTAINABILITY MEANS HAVING THE RIGHT ECO-LABEL

We are certified for some of the major European and local eco-labels; Eurofins, for example, takes into account the most stringent requirements for emissions from products across Europe in their Indoor Air Comfort 'Gold' certification scheme. Some other examples of labels that we are certified for include Germany's Blue Angel and the French product emissions labelling regulation. But proceed with caution. There are labels in the market that are created to look impressive but lack the necessary criteria to actually mean anything. To be credible eco-labels should have the following criteria:

- ✓ Meaningful: Eco-labels should have a set of environmentally meaningful standards. These standards should also be verifiable.
- ✓ Consistency: An eco-label used on one product should have the same meaning if used on other products and be verifiable in a consistent manner.
- ✓ Transparency: The organisation behind an eco-

label should make information about organisational structure, funding, board of directors, and certification standards available to the public.

- ✓ Independent: Certifying organisations and their employees should not have any ties to, and should not receive any funding, sales fees, or contributions, from logo users except fees for certification.
- ✓ Public comment: All certification standards should be developed with input from multiple stakeholders including consumers, industry, environmentalists and social representatives in a way that doesn't compromise the independence of the certifier.

In the world of sustainable products, there can be many different shades of green. Some eco-labels provide useful information, but if customers want to know about product sustainability they should ask for an EPD of a particular product and go from there.

SUSTAINABILITY MEANS STARTING WITH AN EPD

An EPD is the right place to start when assessing the sustainability of a product. And yes we have EPDs (Environmental Product Declaration) for numerous products, with even more in the pipeline. We're committed to having an EPD for every single product. To do this, we have an LCA programme in place, helping us understand and decrease our environmental footprint, but also communicate this type of information to the market. As a first step, we've developed a tool which means we can provide information on the key environmental characteristics of any product through our EFS - Environmental Fact Sheet. We already have EFSs available for all our Wood Wool products, and we are in the process of making EFS available for other products too. In parallel, we've already begun the next step of our programme, which is to develop a system that will be able to provide pre-verified EPDs for GMW and RMW products upon request. This means that as well as an EFS, anyone can ask for a fully verified EPD of any of our products and, when necessary, the time needed to verify this will be minimal. This is a massive improvement on the current process involved in producing an EPD, which can be complicated, costly and time-consuming. We're amongst the pioneers of product sustainability and our LCA programme shows that. But we're not stopping there. In 2014, we will connect this system with our online data collection across all our manufacturing plants, meaning we will be able to provide the next generation of information on the environmental footprint of our products, based on the most up-to-date data. ■

TOO MUCH INFORMATION?

An EPD is a lot to absorb. But product sustainability is too complicated to explain in a couple of words simply because the life of a product is inherently complicated. We're here to help.



MISSION TO ZERO

The environmental impact of insulation is offset hundreds of times when it's used to save energy, but Knauf Insulation aims to minimise its environmental impact even further by reducing energy, waste and any negative impact on resources caused by the production of our insulation.

Knauf Insulation's targets are ambitious, but the company has had ambitious programmes in place for the past decade, particularly for energy reduction which has cut the amount of energy needed in some areas of manufacturing per unit of production by up to 50%. Furthermore, waste reduction targets are being smashed, with all plants in our Northern Europe region already achieving zero waste to landfill, despite an overall target date of 2020.

"As an energy intensive user Knauf Insulation is continually focusing on ways to reduce its impact on the environment and improve business performance by aiming to produce products first and foremost with as little energy as possible," says Allan Morgans, the company's Group Energy Manager.

"In the management of our energy

consumption there are no limits to what we can achieve together. We need to continue our development of energy monitoring and targeting, to understand the expected energy consumption in all aspects of the business and continue to inspire an awareness of energy usage and sustainability to every employee.

"We achieved this by a company-wide commitment to resourcing the energy management role in all facilities and collaborating with each other to ensure best practice is promoted across the whole company," says Morgans.

"The next step is to leave a lasting legacy where all employees feel they can contribute to the continued effort in energy utilisation to perhaps one day achieve a zero impact on the environment." ►

To accelerate the reduction in the impact of its manufacturing processes, Knauf Insulation has begun an Energy Awareness Training programme. The first training session for all Glass Mineral Wool energy managers was held in Cwmbran in the UK focusing on staff behaviour, the sharing of best practice and how to communicate effectively to influence energy-saving measures. The scheme has now been rolled out across other technologies.

Rob Sorby, a production operator on C Set, said: "Instead of the usual management-led process, the workshop allowed people at all levels to get involved and have a voice. It also allowed us to put these ideas into practice."

Tom Mullen from Plant 3 in the US, who recently won the award for best individual performance in energy management across Knauf Insulation has been rolling out the energy awareness training in his plant. "Since implementing the training employees make energy conservation a daily priority through machine and product optimisation. This effort alone played a significant role in the facility achieving a 30% reduction in energy usage over the last year."

"Regarding waste, our biggest contributor to waste is from manufacturing," says Philippe Coune, Environmental Manager Europe & CIS at Knauf Insulation. "Part of the decrease from 2011 to 2012 is due to the implementation of the central data collection system that has improved monitoring, which in itself has encouraged reductions. This causes plants to re-examine the waste chain and we're seeing very positive results."

For Rock Mineral Wool, the company's briquetting systems are successfully recycling 100% of waste from the manufacturing process, while 99% of waste from the creation of Foam goes back into the process. And Knauf Insulation is also exploring a range of innovative ideas to

recycle waste from Wood Wool. At Oosterhout in the Netherlands, for example, the company has collaborated with one manufacturer to use wood scrap to create benches.

The successful tackling of waste at Knauf Insulation has been underscored by the success of the company's four UK plants. St Helens, Cwmbran, Queensferry and Hartlepool no longer send waste to landfill. At the company's mineral wool plant in Queensferry, Knauf Insulation now works with industrial partners that take its waste as raw material, while at St Helens and Cwmbran, baled Glass Mineral Wool waste is used by a ceiling tile manufacturer and mixed glass wool and packaging waste is reprocessed for use as underground bedding. At Hartlepool all manufacturing waste is recycled back into the production process while general and kitchen waste is collected by a recycling and waste management partner. The plant also provides a community interest company with waste materials such as cardboard which are used as arts and crafts resources in schools, community centres and colleges.

Knauf Insulation has also completed a recycling facility that feeds excess material back into the manufacturing process and agreements have been made with key customers to return waste for re-use. Waste across the plants is also segregated at source to improve recycling. A 'Bin the Bin' campaign launched as part of EcoWorks, a best practice campaign for employees, now provides clearly marked recycling bins, desktop recycling folders and skips for cardboard and polythene. "True sustainability is about much more than simply producing green products. It must be an integral part of the business, achieving zero waste to landfill is a clear demonstration of our commitment to improving our environmental performance," says Kevin West, Health, Safety, Security and Environmental manager. ■

IN NUMBERS:

37.6%

Reduction in waste to landfill from our 2010 baseline.

12.8%

Less energy (Mwh) per tonne of product since 2010

HAIRDRYERS AND CHEESEBURGERS

"During training I pass round a beer bottle and a fibre made from recycled glass and use them to illustrate the value of recycling," says Director of Product Affairs and Sustainability for North America, Scott Miller. "I then explain that by recycling that bottle you are saving enough energy to power a hairdryer for 10 minutes."

"At Knauf Insulation we are using more than a million of those bottles every day, 24 hours a day, seven

days a week, every day of the year. "Recycling is crucial to the future of our grandchildren and to our business, but you need to make it easily digestible."

Miller stresses the importance of understanding the big picture to promote good sustainable practice. "Take the example of a cheeseburger. Seeds had to be sown, fields ploughed for wheat for the bun, cows raised for milk for the cheese and beef. Then all these

elements need to be manufactured, then packaged, distributed and so on.

"I want people to understand that at every step of the way there is an environmental impact. And it is the same at Knauf Insulation, by examining every process to find better ways of doing things we can make a contribution to the environment and make a contribution to the cost-effectiveness of the company."



Protecting *our* assets

Focusing on positive dialogue and proactively managing risks are vital to the creation of a safer environment at Knauf Insulation.

“Having an externally certified management system with nice procedures and forms for health and safety are great to have, but they are wasted if they do not translate into positive changes on the shop floor,” says Knauf Insulation’s Director of Health, Safety and Environment, Jef Snackaert.

Snackaert believes positive reinforcement of safe behaviour and a proactive approach towards managing risks are key elements of a successful health and safety environment at Knauf Insulation.

“A classic mistake often made by companies is to deploy an army of safety ‘inspectors’ to police and enforce compliance with the rules and procedures,” he says. “This isn’t effective. A better way is to have all line managers act as safety leaders and have them taking full ownership for driving the safety efforts all the way down to the shop floor. This is called visible felt safety leadership.

“Now this is all very well and good, but how is it achieved? First of all you explain and clarify at all levels of the organisation the ‘why’ of safety; i.e. why is a specific safety measure there in the first place. Then you explain what the measure is aimed at and how it will help.

“This can be done through hands-on, interactive training workshops that make people think for themselves. They can cover everything from the methodology for investigating and fully understanding the underlying causes of incidents to hazard spotting and risk evaluation, down to pro-actively ▶

considering HSE and energy aspects when designing a new production line or process or installing a new machine or launching a new product," says Snackaert.

"Then it's a matter of all levels of management walking the talk. This means never turning a blind eye, driving safe behaviours through positive reinforcement, consistent application of the safety rules and procedures and by displaying the right sense of urgency when things go wrong."

A positive approach towards safety is critical, says Snackaert, because good safety performance is the result of positive reinforcement of safe behaviours, for example, by recognising and rewarding people for good safety performance.

"The leadership of Knauf Insulation has spent a great deal of time and effort putting in place a good management system, meeting all the requirements of the certification standards. Now, it's time for the company to take this to the next level - go out and actively drive safe behaviour."

So how will this be implemented? According to Snackaert, it's about making safety more visibly felt, it's about engaging people into safety thinking in a positive way, it's about line managers getting out of offices onto the shop floor and doing safety observations and conversations.

"This should not be formal or complicated," says Snackaert. "It can be as simple as a 10 minute chat with an operator, starting with some open questions such as: 'I'm interested in what you do, could you explain why you do this activity in this way?' or 'What could go wrong when you do this in this way?', 'How could you get hurt?' and then onto 'How could you do it in a better and safer way?'"

More often than not, those working on the shop floor have immense levels of knowledge and experience that has been honed over many years, says Snackaert, so they are the best people to identify better safety solutions.

"Everyone appreciates being treated with respect and everyone appreciates an interest being shown in their work. Implementing and nurturing this type of dialogue is one of the things Knauf Insulation can do to further raise the bar in terms of its safety performance."

The success of a company depends on its people and people rightly expect the company they work for to provide a safe and healthy work environment and treat them with respect.

"The safety performance of an organisation is about more than the number of accidents, it is also a barometer for an organisation's professionalism and sustainable business success," says Snackaert. ■

MAKING DATA COUNT

The collection of accurate, standardised accident data is a critical component of health and safety at Knauf Insulation and the first important step towards achieving zero harm.

The company has committed to reducing Lost Time Accidents (LTAs) by 50% by the year 2020, and whilst we saw a reduction of 6.4% since 2011, in 2012 the number of lost time accidents is still higher than the 2010 baseline year.

"We have become better at capturing and classifying the various types of personal injury cases and at establishing an open reporting culture,

which explains why we see an increase in the accident frequency rate," says Hilde Vermeiren, Regional HSE & Systems Manager at Knauf Insulation.

"Reporting an increase in the accident frequency rate may be seen as something negative and indeed our performance must improve. However at Knauf Insulation we believe that an open reporting culture and an improved data integrity will allow us to assess why we have these accidents, and therefore better target our actions to help prevent accidents in the future."



OUR PEOPLE MAKE A SUSTAINABLE DIFFERENCE

Knauf Insulation's 'triple-E' strategy is designed to energise, enable and engage everyone in the company. What does it mean in practice?

ENERGISE: ENSURING EMPLOYEES ARE FIT, HEALTHY, INFORMED AND INSPIRED

Andreja Tušek, data steward in production planning Skofja Loka, Slovenia: "Hot meals are provided for all employees regardless of the fact that the working process is organised in four shifts. A salad bar, healthy options and vegetarian menu are some of the most welcome changes."

Anna Guzman, financial analyst, Mont-Saint-Guibert, Belgium: "Having a fruit basket in the workplace prevents me from snacking unhealthy food and helps me to keep up my five-a-day."

Jean-François Touette, Visé, Belgium: "I think the new Visé Life monthly magazine which carries news about the plant is an excellent idea. It allows us to put names to faces and helps me keep track of plant activities, projects, training, new employees and specific topics of interest."

Jelica Kostadinovic, human resources manager, Serbia: "To improve internal communication we started a quarterly employee newsletter. The first edition introduced the Southern Balkan management team, showed pictures from the New Years' party for employees' children and details about the sustainability report for 2012. In the second we plan to inform employees about production line news as well as health and safety procedures."

ENABLE: DEVELOPING IMPACTFUL BEHAVIOUR AS WELL AS LEARNING NEW SKILLS

Virginie Limbourg, group HR development manager: "An important part of our Triple-E sustainable people strategy is the 360° assessment. We launched this with board members as a pilot group. Our aim is to cover other management teams across regions in the next two years."



Prize-winning children's painting



Fruit baskets are encouraged to keep employees healthy



Making A Difference project

"The KI 360° programme evaluates performance through feedback from peers, managers, reports and the individual themselves and helps to better understand their strengths and development areas. It also enables us as a company to set up support for continuous development, targeted at real and concrete individual potential as well as to develop key required skills."

Eva Davila: "L'École de l'Isolation is a training centre for our customers designed to teach them about Knauf Insulation products and implementation techniques. Recently, the school opened its doors to Knauf Insulation employees from France, Western Europe and Central."

"Attending a specific training on accessories gave us improved awareness about our system approach. Synergy was created from the diversity of the participants from different departments enabling us to roll out best practices, centralise the purchasing for accessories and significantly improve our offers for systems and solutions in the many regions."

Giuliano Camillato responsible technical advice (France): "The trainer was accessible and competent and the course material comprehensive. I am very satisfied with the training. I received a lot of practical information and detailed answers to my questions."

ENGAGE: DEMONSTRATING ENTREPRENEURSHIP AND KEEPING OUR COMMUNITY IN MIND

To further engage the families of employees at Surdulica in Serbia, an art competition was organised for employees' children as well as a trip to Belgrade. The children's work will now be printed in a special calendar.

Radmilo Mitrovic, maintenance shift worker: "My daughter asks me every day when we will do this again." ■



ACTION NOT JUST WORDS

Commitment to the Knauf Group Values is designed to provide a better workplace for everyone.

When it comes to the implementation of the Knauf Group Values of 'Commitment', 'Entrepreneurship', 'Partnership' and 'Menschlichkeit', the company believes that its actions should speak louder than its words.

With this in mind, articulating these Values properly is the first step in ensuring they can be lived. A total of 250 Value Ambassadors have been appointed to organise about 300 workshops for Knauf Insulation's 5,000 employees in 35 countries with the aim of transforming those four words into life-changing and work-transforming action.

Knauf Insulation aims to have carried out workshops from the biggest plant to the smallest office by the beginning of 2014. A process that encompasses discussions, presentations and ultimately commitments.

"It's vital that everyone makes a commitment to actions where she or he can make a personal contribution to change for the better," says Barbara-Maria Loth, Vice President of Organisation and People Development for Knauf Insulation in North America. "The way we communicate our Values in those workshops invites everyone to think about their share in our company culture and life. It respects the individual but also holds everyone accountable for making progress in living our Values as well as possible."

But what does this mean in reality? "We moderate discussions where the teams find solutions to their problems by themselves and commit to change their

actions. We avoid 'finger-pointing' exercises that usually increase levels of frustration and lead to a culture where people do not think their active contribution is appreciated. With this the company intends to stimulate partnership in the team, make room for entrepreneurial action and demonstrate commitment by starting with it right the next day."

This requires a guided process. All Value Ambassadors went through a comprehensive training process and the rollout follows a timetable. Following the workshops, concepts, solutions, innovations and ways of overcoming company challenges will be passed to company decision makers who will examine the feedback and prioritise the most important areas that require action.

"This is where commitment is demonstrated at every level regardless of hierarchy," says Loth. "Everyone from the plant floor to the Knauf Insulation Management Board agrees on a course of action and makes it happen. Everyone goes that extra mile."

"Real, genuinely innovative companies are open to understanding the process of change as part of their corporate life and know about the powerful impact of engaging with everyone at every level to make continuous improvement a reality. The Knauf Group is committed to this course of action through the implementation of its Values. The outcome will undoubtedly be a better, more comfortable place to work. For everyone."

THERE'S A LOT OF KNAUF IN ME.
THEN AGAIN, THERE'S A LOT OF ME
IN KNAUF, TOO.



Beyond factory gates...

One of Knauf Insulation's most important values is to have the wellbeing of everyone in society in mind.



Help for the homeless

Throughout 2012 Knauf Insulation donated enough insulation materials to cover more than eight Wimbledon tennis courts to projects for the homeless around the UK.

The action was carried out through CRASH, the construction and property industry's charity, which works to refurbish buildings to provide safe shelters for homeless people.

As a result of its support Knauf Insulation won the 'CRASH Above And Beyond Award' in recognition of being the largest supplier of materials to the charity in 2012.

The projects included the transformation of a historic priory into self-contained flats in Newcastle; the division of a building into bedsits in Bristol; the refurbishment of flats in Liverpool and four accommodation units in the county of Norfolk.

In addition to product donations, Knauf Insulation employees raised more than £8,000 in donations from various charity events including a 'Tour de Knauf Insulation' 365-mile sponsored cycle ride.

"Knauf Insulation has had a huge impact on our projects by donating the materials that we need to optimise the energy efficiency of the buildings as well as ensure outstanding thermal and acoustic performance," said Emma Brophy of CRASH. "We can't thank Knauf Insulation enough for their support."

MAD ABOUT MAKING A DIFFERENCE

Rather than celebrate New Year's with a party, employees at Knauf Insulation's Mont-Saint-Guibert office decided to go MAD - 'Make a Difference' - by volunteering to decorate the new Paul Henricot Maternity House in Court-Saint-Etienne, Belgium.

Set up in 1937, the shelter supports vulnerable mothers and their children. "It was the perfect opportunity to showcase that Menschlichkeit, Partnership, Commitment and Entrepreneurship are not just words," said Patrice Briol, Group HR Director of Knauf Insulation. "We wanted to show that when you connect the Knauf values dots, you touch and feel the big picture and it's great to experience the difference it makes."



SMART MOVE

Knauf Insulation in Australia has become the key partner of CitySmart, Brisbane City Council's sustainable agency, an organisation that aims to help businesses and residents realise a sustainable future.

"Partnering with CitySmart was a natural choice for Knauf Insulation as the aims of the agency are aligned with ours in terms of ensuring a sustainable future and promoting energy efficiency," said Knauf Insulation's Ravi Chandra, General Manager - Regulatory Affairs and Public Policy for Australia and New Zealand.

Plant is energised by visit

Klaus Breil, energy policy spokesman for the German Free Democratic Party, recently paid a visit to Knauf Insulation's factory at Simbach as part of a public energy efficiency information campaign organised by DENEFF - the voice of energy efficiency industry - designed to showcase 'Factories of the energy revolution'. During his visit, the spokesman underlined the importance of energy efficiency measures to achieve affordable energy targets.



Klaus Breil, second right, at the Simach plant

WORKING PARTNERSHIPS

Knauf Insulation France is actively contributing to the integration of registered disabled people through a variety of work projects.

Since 2012 Knauf Insulation has been allocating projects to the 80 registered disabled based at Etablissement et Services d'Aide par le Travail (ESAT) L'Ensoleillade in Pau.

These projects have ranged from the assembly of Polyfoam Duo samples and the filling of promotional bags to the creation of sample bags for Thermo Loft and marketing material for Comble à Souffler for a DIY launch project.

The workers at ESAT L'Ensoleillade are supervised by a team of 11 instructors who support the disabled workers in a wide range of working environments.



Recycling glass in Russia

Knauf Insulation has linked up with the local government to launch a glass-recycling programme in the Russian district of Stupino. Glass can now be deposited in containers at six pilot points throughout the district. The glass is then used by Knauf Insulation to produce the raw ground pellets or cullet used in the manufacture of Glass Mineral Wool.



BOWLED OVER BY ACTION IN COMMUNITY

Employees at Knauf Insulation's Krupa plant have been organising social events for children at the Arkádie special needs centre and from the DOZP Všebovice crèche. Highlights included a bowling evening organised by factory employees with Telefónica O2, the Skittles Club and Volunteer Centre. Handmade diplomas, medals and sweets were liberally awarded to the youngsters, but the biggest reward of the entire event was the children's applause.

LESSONS IN EFFICIENCY

Three primary schools in the Škofja Loka Region of Slovenia have become more energy efficient thanks to the installation of Knauf Insulation. Within a local environmental project known as Loško je ekološko, the company carried out initial energy assessments, sourced the best products, coordinated work with contractors and supervised the entire project.

Knauf Insulation in figures

ENVIRONMENTAL PERFORMANCE IN FIGURES

Of the below indicators, energy and waste are our priority areas. Having mapped what areas of operation impacted each area (see 2012 report), manufacturing was identified as having the biggest impact by far. This is why, we continue to concentrate our efforts on energy and waste, particularly in manufacturing. See more on pages 46-49 about how we have addressed energy and waste.



Baseline	100%	2010
	72.4%	2011
	62.4%	2012

Down 37.6% from baseline | Down 10% from 2011

We have a strong commitment for waste to landfill, namely to be zero waste to landfill by 2020. This is driving our colleagues to re-examine the waste chain and we're seeing very positive results. Part of the decrease from 2011 to 2012 is due to the implementation of the central data collection system that has improved monitoring, which in itself has encouraged reductions.



Baseline	100%	2010
	104.1%	2011
	86.6%	2012

Down 13.4% from baseline | Down 17.5% from 2011

A conscious change in the raw material for RMW led to the reduction in emissions of SO_x per tonne of product.



Baseline	100%	2010
	84.8%	2011
	84.9%	2012

Down 15.1% from baseline | Up 0.1% from 2011

Our NO_x emissions have remained almost constant from 2011 to 2012, continuing our significant reduction in NO_x.



Baseline	100%	2010
	88.0%	2011
	87.2%	2012

Down 12.8% from baseline | Down 0.8% from 2011

We remain on track to meet our 2020 objectives. In 2012 we saw massive rejuvenation of several important production lines, including significant investment in our Belgium plant, Vise. Whilst our energy per Mwh/tons decreased from 2011 to 2012, we expect to see bigger reductions in energy in the next data set through improved Energy Management systems as well as the Energy Awareness programme, which was rolled out in 2013.



Baseline	100%	2010
	87.5%	2011
	88.5%	2012

Down 11.5% from baseline | Up 1.0% from 2011

Our CO₂ figure is related to our energy use and has therefore experienced a similar trend for the reasons explained in 'Energy'.



Baseline	100%	2010
	97.7%	2011
	91.9%	2012

Down 8.1% from baseline | Down 5.8% from 2011

Water is not a priority impact, although process efficiencies are helping make small reductions, which is why we are pleased to see another year in a row of reductions in water use.



Baseline	100%	2010
	101.6%	2011
	100.3%	2012

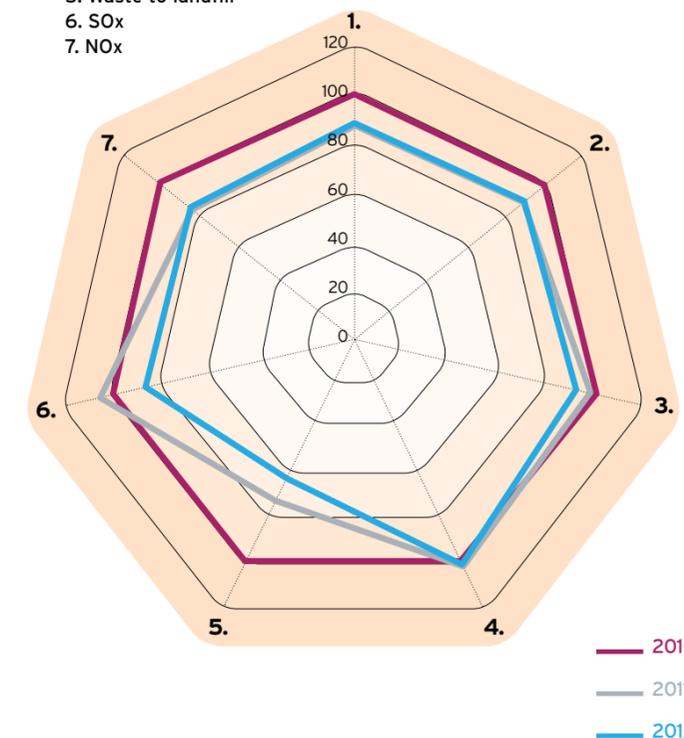
Up 0.3% from our baseline | Down 1.3% from 2011

We discharge very small amounts of water per tonne of product but in general have remained relatively constant in terms of discharge, with a decrease from 2011 to 2012*

*Note: due to a redefinition of waste water (which since 2012 now excludes rain water) our 2010 and 2011 figures have been amended. This is based on an estimation that rain water represented 25% of waste water discharge.

ON THE ROAD TO ZERO

1. Energy
2. CO₂
3. Water use
4. Water discharge
5. Waste to landfill
6. SO_x
7. NO_x



HEALTH, SAFETY AND WELL-BEING

We're continuing to understand which Key Performance Indicators will help us best measure our progress towards having the best sustainable Triple-E strategy in our industry and also ensure consistent definitions across the company for indicators such as the severity of Lost Time Accidents. As such, we are showing limited KPIs for health, safety and well-being and will look to expand these in the future.

Frequency of LTAs (Lost Time Accidents)

Baseline	100%
	106.6%
	100.2%

Down 6.4% from 2011 | Up 0.2% from baseline

We are working hard to improve this figure while continuing to breed a positive and honest reporting culture.

FTE (Full Time Equivalent)

Baseline	100%
	102.5%
	101.1%

Down 1.4% from 2011 | Up 1.1% from baseline

While the total number of employees has increased since our baseline year, we have seen a slight reduction in the number of FTE since 2011 due to plant closures.

Average training hours

Baseline	100%
	130.4%
	106.5%

Down 23.9% from 2011 | Up 6.5% from baseline

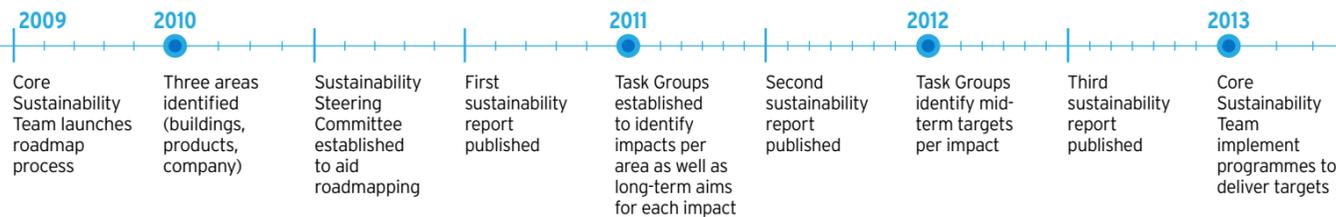
Due to fewer newcomers in 2012 we saw less inductions defined as training for our records. The level of training post-induction, however, remained stable.

NORMALISED DATA ACCORDING TO 2010 BASELINE

Roadmapping our future

Since 2009 we have been developing a roadmap process that aims to incorporate sustainability more deeply across the business, making it a part of our DNA, a part of everything we do. To help achieve this, an internal Sustainability Steering Committee was set up in 2010 to support the company's sustainable development strategy. This committee identified three objectives; i) be recognised for championing energy efficiency in buildings ii) to have products recognised as best in class in terms of sustainability, iii) be recognised as a responsible manufacturer and employer.

TIMELINE



The committee then identified nine areas of operations that impacted these objectives and four Task Groups were set up to manage one or a number of these areas of operation. These groups mapped long-term aims and mid-term targets for each impact area. In the past 18 months, the groups have been working on programmes to deliver these targets. ■

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	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 targets and programmes
	Zero negative impact on resource use	Substitution of resources with resources 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	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.



Urbanscape

An innovative Green Roof Solution



Benefits

- Complete solution
- Lightness
- High water absorption
- Efficient installation
- Sustainability



KNAUFINSULATION

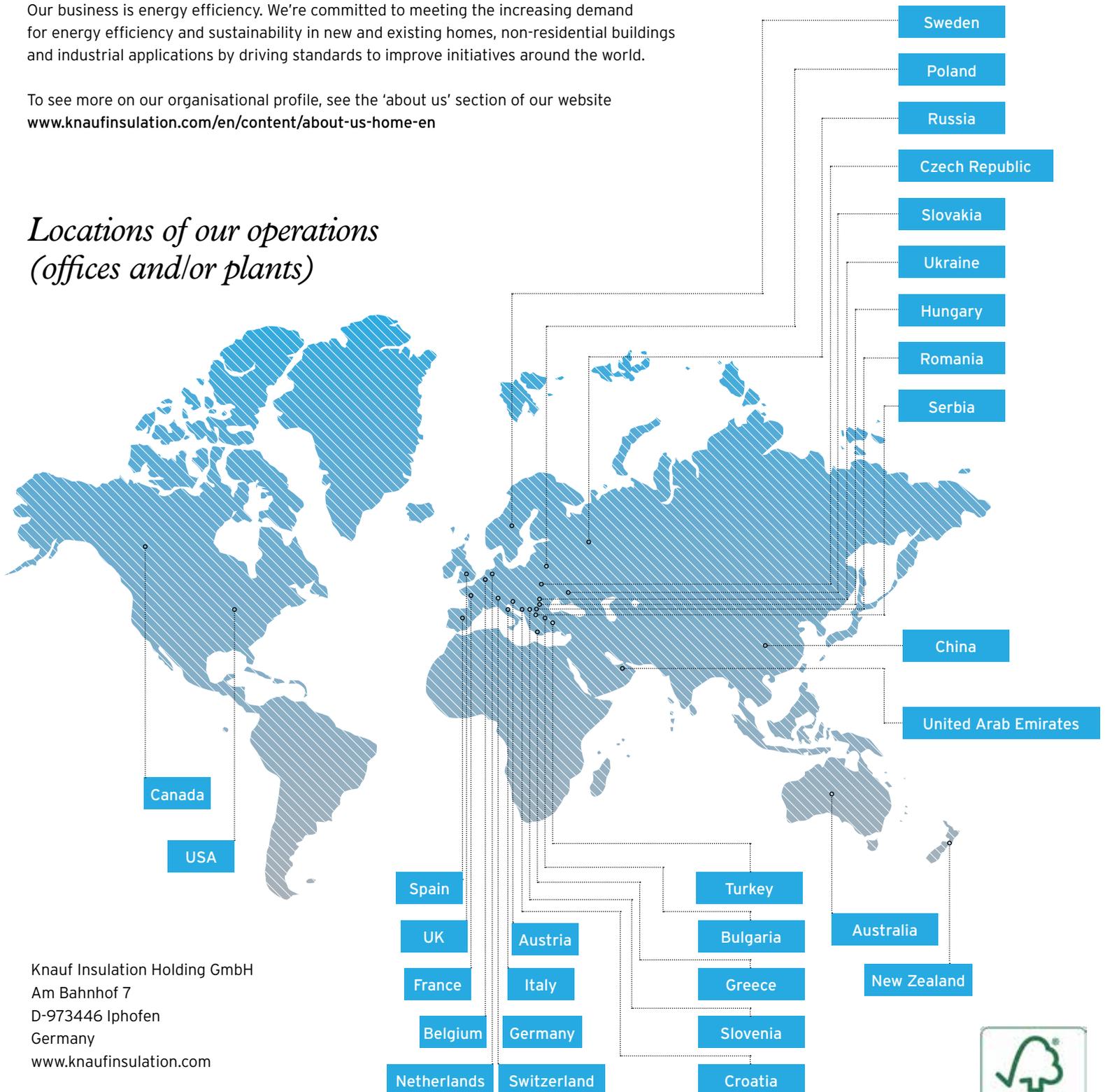
it's time to save energy

Knauf Insulation is one of the world's largest manufacturers of insulation products and solutions. With 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/en/content/about-us-home-en

Locations of our operations (offices and/or plants)



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