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INSULATION MATTERS

KNAUFINSULATION
it's time to save energy

*How our services help specifiers
Reframing the energy efficiency debate
From acquisition to integration in the US
Performance, at the heart of all our solutions*



NATURE MEETS
THERMAL INSULATION



ARCTIC WHITE

Wood Wool Insulation Inspired by Nature

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



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COVER
IMAGE

How our solutions contribute to low energy buildings.

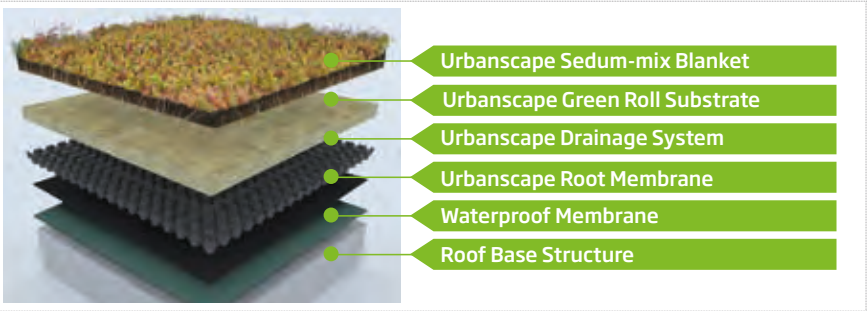
In this sustainable home in the Belgium country side, Urbanscape Green Roofs, Supafil Cavity Wall insulation and JetSpray solutions were used. See pages 6 to 10.

Architect:
Kristof Van Hoof
Zandhoven (B)



Urbanscape

An innovative Green Roof Solution



Benefits

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



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Above and beyond



Great companies don't just offer their customers the products they request but provide solutions to the problems they need solving. As the world moves to low energy buildings as standard and policy makers drive increased thermal renovation of buildings, our customers face new problems and need new solutions. As we reveal in this year's **Insulation Matters** report, Knauf Insulation is striving to develop and bring to market many of the solutions that will be vital to support our customers in delivering a low energy built environment.

In today's market, success has to be measured by a company's ability to develop innovative solutions to help deliver low energy buildings and we are working constantly to increase our capability to deliver these solutions. The supply chain in the construction industry is conservative and our delivery needs to be as innovative as our solutions.

Throughout this report, we are showcasing these ground-breaking solutions, innovations that include Kventi, a revolutionary system that cuts in half the time to install a new insulated roof; Homeseal, a range that offers a complete solution to airtightness and JetSpray, a new system that allows contractors to easily and quickly insulate difficult-to-reach areas such as crawl spaces and basements.

Mineral Plus, meanwhile, is another state-of-the-art solution that has been welcomed by contractors. Not only does it reduce significantly the storage space needed, compared to traditional Rock Mineral Wool, but its flexibility makes it ideal for installing in cavity spaces and on top of cabling.

But we are not stopping there. Given the need to help the building chain to get the most from these new innovations, we have also strengthened our commitment to Knauf Insulation Academies, where contractors and others can get first-hand experience of our newest innovations.

And now more than ever it's time for these solutions. Buildings still account for the largest share of energy use in society and whether to help in the fight against climate change or simply to ensure we use energy to power our economies rather than waste it in inefficient buildings, we need to find ways to deliver better and cheaper low energy buildings. At the same time, governments need to remain ambitious in their demands for low energy new buildings and redouble their commitment to renovation to ensure that the market is driven to both innovate and adopt these innovations.

It has always been our purpose to save energy and now more and more it's our purpose to deliver the solutions that make saving energy easier than ever before.



Tony Robson
Chief Executive Officer
Knauf Insulation

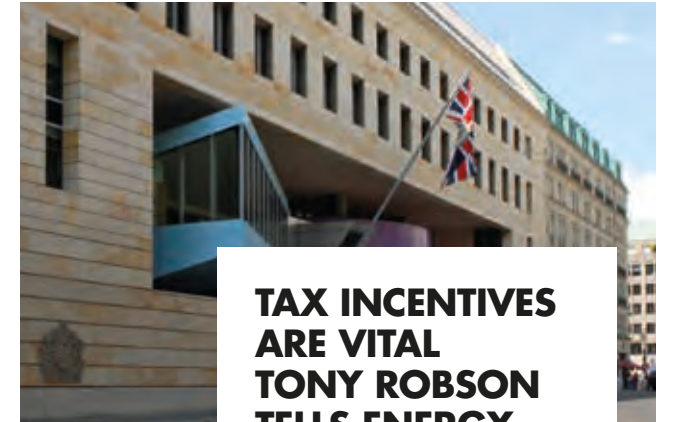
TURKEY'S MOST INNOVATIVE CONSTRUCTION PRODUCT

Earthwool has been voted Turkey's most Innovative Construction Product of the Year 2014 by the magazine company B2B Medya. The award was presented to our General Manager in Turkey, Emre Gürçan, by the Construction Materials Manufacturers' Association at a special ceremony held at the annual Construction Fair in Istanbul.



KNAUF INSULATION'S EXPERT RANGE FIRST TO BE 'VALIDATED BY DOCTORS'

In October 2014, Knauf Insulation's EXPERT range of Glass Mineral Wool was recognised as 'Validated by Doctors' by the French Association of Health Professionals, ASEF (Association Santé Environnement France) in collaboration with Leroy Merlin.



TAX INCENTIVES ARE VITAL TONY ROBSON TELLS ENERGY CONFERENCE IN GERMANY

Tony Robson, CEO of Knauf Insulation, underlined the importance of tax incentives and the role they can play in increasing deep renovation of buildings during Knauf Insulation's Parliamentary Evening held in Berlin in February 2015. Opening the event, which was held following the annual conference of DENEFF – the German voice of energy efficiency – Mr Robson called for an increase in renovation in Germany and a strong commitment to the implementation of the 2012 European Energy Efficiency Directive. More than 250 policy makers and energy efficiency stakeholders met together with industry and association representatives during the event to discuss the next steps that German politicians need to take to make energy efficiency more attractive to consumers.

UK'S TOP SUPPLIER

Knauf Insulation was voted Supplier of the Year in the Roofing and Insulation category of the National Buying Group (NBG) awards. The award recognised suppliers that contributed the most to improving partner sales.



ROMANIAN SUSTAINABILITY HONOUR

Knauf Insulation took top honours in the Sustainability category of the fourth annual awards of the Euro-Building Conference on Sustainable Construction and Energy Efficiency organised by Romanian construction magazine Agenda Constructiilor. The awards recognise "excellence in the business of building".



URBANSCAPE VOTED MOST SUSTAINABLE PRODUCT

Urbanscape was voted 'Sustainable Product of the Year 2014' in Slovenia by Eco Fund, the Slovenian Environmental Public Fund, and the country's leading business daily Finance. Urbanscape received the honour for its "design, functional flexibility in numerous applications and complying with the toughest environmental standards and sustainability requirements". Judges were also impressed by the environmental credentials of Urbanscape including improved storm water management, improved air quality in cities and of course exceptional energy efficiency.



MANUFACTURER OF THE YEAR AT THE 2014 BUILDING AWARDS

Knauf Insulation won the title of Manufacturer of the Year at the UK's 2014 Building Awards in recognition of achievements including compression packaging, innovations such as SUPAFIL, achieving zero waste to landfill and supporting construction industry charity CRASH.



INTEGRATION OF ECOSE TECHNOLOGY INTO NEW KNAUF INSULATION PLANTS IN THE UNITED STATES

A year after Knauf Insulation's acquisition of Guardian Insulation in the US the integration has allowed the company to begin incorporating its technologies such as the transition to manufacturing products with ECOSE Technology. Knauf Insulation's ECOSE binder technology has no added formaldehyde and has a lower environmental impact in its manufacture compared to our traditional Glass Mineral Wool.

INSTALLER WINS THE ECOSE COMPETITION

To celebrate five years of ECOSE Technology our team in France launched a competition with a star prize of an electric Renault Kangoo ZE. More than a thousand wholesalers and 1,200 installers were targeted in the competition through a variety of events and in-store promotions. The lucky winner was a Mr Commeureuc.



IT'S TIME TO SAVE TIME

We believe the greatest gift you can give an installer is time – the ability to install products faster and more efficiently without compromising performance. We spoke to installers about the benefits they gained by using our solutions.

*“We can quickly insulate the external wall cavities of a house within **half a day** through small holes in the wall. These holes are **easily filled** and there is no visual trace of the work.”*

Raoul Kiksen of **Nederland Isoleert**, SUPAFIL installer, Netherlands

CAVITY

*“We installed 5,000m² of Mineral Plus insulation in **half the time** it would take to install traditional Rock Mineral Wool. It was **more flexible** and **easier** to install because it avoids unnecessary cutting around cabling and **fits simply** and **quickly** into cavity spaces.”*

İsmet Haliloglu, Form Akustik, Turkey

Cavity walls - the void between an inner and outer wall - exist in both existing and new builds.

For renovation, filling cavities has previously involved time-consuming, disruptive removal of the wall to install the insulation. Knauf Insulation's SUPAFIL is a system that blows specially formulated Glass Mineral Wool through a one-inch hole, straight into the cavity. Repeated at one-metre distances across the wall face, this avoids the huge amounts of time required to remove a wall and clean up afterwards.

“We can quickly insulate the external wall cavities of a house within half a day through small holes in the wall. These holes are easily filled and there is no visual trace of the work. Afterwards homeowners enjoy an enormous increase in comfort as well as savings of up to 30% on their bills.” **Raoul Kiksen**, SUPAFIL installer at **Nederland Isoleert**.

For installers this means cavities can be installed in record times and for homeowners, this avoids long periods of disruptive work.

“I was really surprised to see how fast the installation was done. The work was finished in a couple of hours. That was perfect.” **Robbie Seigers**, homeowner.

For new build, you may think you have a greater choice in the insulation material you use as you can install it as you construct the wall. But cables and pipes that run through a cavity can complicate the simplest installation. Mineral Plus, however, fits flush into panels and compresses neatly against cables – avoiding unnecessary cutting around cabling without causing gaps, maintaining thermal and acoustic performance and, more importantly for the installer, takes less time.

The compressed packaging of Mineral Plus also saves space as well as time. In Turkey, a load of 5,760m² of 50mm Mineral Plus can be delivered in just one trip by an 80m³ truck. The same amount of traditional Rock Mineral Wool would require 3.6 trips in the same truck. On site, Mineral Plus uses less than a third of the storage space that would be required of the same surface area of Rock Mineral Wool, so is easier to store on a work site. Mineral Plus is also lighter than Rock Mineral Wool so it's easier to handle.

“Large amounts of Mineral Plus can be easily transported because of its compressed packaging. This means we can use small transporters rather than trailer trucks in narrow streets and carry out work quickly and easily.” **Semih Kadri Felek**, Architect at **SKF Architecture**.

Whether new build or renovation, Knauf Insulation offers solutions that deliver performance faster and more efficiently.

THE CHOICE OF ACCESSORIES CAN BE OVERWHELMING

DON'T LET PERFORMANCE SUFFER, WE'VE DONE THE SELECTING FOR YOU.

When buying ready-to-assemble furniture, you probably don't expect to be told to screw two parts together without being provided with the right screws for the job. That's what we've done with the accessories in our new Homeseal system. Our range of accessories has been carefully selected to be optimal with our insulation, ensuring improved airtightness in buildings for a more energy efficient home.

To choose the right tape, for example, we carried out extensive analysis and durability tests with Kassel University in Germany to ensure the right products offer the right strength and durability. We've selected products that work together to make the system as simple as possible. The range is also colour coded to make your choice easier.

“There are hundreds of potential accessories out there to choose from. It's reassuring knowing that with the Homeseal system I have the best for Knauf Insulation products”

Carlos Pais, installer at **IFPC Company**, France

GREEN ROOF

*“It’s possible to enjoy an urban oasis of greenery in **just a few hours** with Urbanscape. Installation is **straightforward** because there are no complicated drainage systems or expensive roof preparations to install. You just simply unroll the root barrier membrane, the all-in-one drainage system, Rock Mineral Wool multipurpose growing layer and then the green layer of vegetation.”*

Mario Cuk, M&M CUK GmbH, Germany

Traditional green roofs usually involve detailed planning, numerous bags of soil, landscaping, horticultural expertise and of course a lot of patience to watch plants grow until they reach an attractive density.

As an installer, all that can take valuable time. So to help installers we’ve produced a green roof solution that is lightweight and uncomplicated; Urbanscape.

Installers enjoy reduced installation time because it is exceptionally light, meaning less transportation and no carrying around heavy bags of soil. Not only that, but with Urbanscape being a complete system, including the root barrier membrane, drainage system, growing layer and then the vegetation, installers have less to deal with.

“Installation is straightforward because there are no complicated drainage systems or expensive roof preparations to install,” said **Mario Cuk**, an installer at **M&M CUK**, Germany.

Furthermore, the Rock Mineral Wool multipurpose growing layer is five to ten times lighter than traditional green roof substrates, again helping reduce installation time.

Lastly, the layer of vegetation is easily installed to complete the system, meaning the green roof is already green.

When Urbanscape was installed on a 500m² residential complex in Germany, for example, it took only a day’s work to complete the entire system.

“It’s possible to enjoy an urban oasis of greenery in just a few hours with Urbanscape,” said Cuk.

See more about Urbanscape on page 42.

BASEMENT CEILING + CRAWL SPACE INSULATION

*“JetSpray is a high performance solution that allows me to carry out insulation installations **efficiently** and **easily** without disturbing residents. It’s also **certified to the highest European standards** for air quality and comfort, confirmed by Eurofins Indoor Air Comfort Gold and Blue Angel, which is a major benefit for householders as well as for those carrying out the installation.”*

Björn La Grouw, Warmterijk, the Netherlands

Have you ever tried sticking an insulation board to a ceiling lying on your back, in a space just a metre high? It’s not easy. That is why we developed JetSpray, an innovative solution using our blowing wool.

It’s easily applied, can spray up to 210mm insulation thickness in one stroke and on average installations can be carried out in less than a day without disrupting homeowners.

JetSpray is also a high performance solution that meets the most stringent European standards for indoor air quality and comfort including Eurofins Indoor Air Comfort Gold, Blue Angel and French VOC A+ labels.

Each JetSpray kit contains everything to get started immediately including pump, blowing machine, preparation containers and hose.

To ensure application is done perfectly, there is full technical support that includes theoretical and practical training at Knauf Insulation facilities, on-site checks of work by the company, technical support, clear application guidelines, brochures and videos.

PITCHED ROOF INSULATION

*“With Kventi we gained between **40 and 50% in installation time**. Kventi provides three functions in one – simultaneously we can install the insulation, the battens and counter battens for the tiles, and the roofing underlay.”*

Didier Loizeau, Master roofer – awarded the prestigious Meilleurs Ouvriers de France, owner of **Les Toits du Bearn**

The process of changing a roof can take weeks, leaving property owners and installers at the mercy of the weather.

Pitched roof renovation in particular can be notoriously complicated involving detailed on-site assessment, sourcing different materials from different places and then ensuring everything comes together perfectly on site.

Furthermore, roofs for both new build and renovation have become increasingly complex in many countries as demand for factors such as airtightness has grown.

That means there is a need for simple systems to respond to complex requirements that are easy to install.

With Kventi, Knauf Insulation's roof system, we have combined all the elements an installer needs at a job site including the insulation, boards, screws, sealant, and vapour control layers.

Kventi provides roof installers with all the products required in a single delivery with clear installation instructions online and the entire job can be completed quickly and efficiently.

The Kventi board features pre-printed patterns on products to ensure perfect alignment and fast efficient installation (supported by on-line information and videos).

“The quality of the patented edge finishes of Kventi boards makes it easier to adapt to distortions we might see in pitched roof construction,” says **Didier Loizeau**.

Installers can also rest assured that Kventi boards are strong enough for them to stand on, ensuring safe and convenient working conditions.

Furthermore, as building energy efficiency regulations become increasingly demanding, it is important to ensure that buildings are as thermally efficient and as airtight as possible.

“On top of the reduction in installation time, Kventi achieves excellent water/ airtightness and offers good acoustic performance and low waste,” says Loizeau.

There are also plenty of benefits for homeowners. As the system is installed above and between rafters it avoids the need to ‘steal’ space from rooms below. Furthermore, because work is carried out externally, there is minimal disturbance and dust for homeowners during installation and if there is an internal fixture there is no need to demolish it.

ECOSEAL+



DRAWING THE LINE ON CONFIDENCE

ECOSEAL Plus air sealant helps builders meet the changing codes and demands of the housing market in the United States. Meeting and exceeding the stricter air-sealing codes and homebuyer expectations for energy efficient homes will set builders apart. Rely on ECOSEAL Plus - an air-sealing product you can trust.

PERFORMANCE

ECOSEAL Plus provides performance with the Gasket Pro Technology that is consistent. Energy efficiency means lower energy bills for your customer.

RELIABILITY

ECOSEAL Plus is reliable, which means fewer call-backs, happier homeowners, and more profits for you. Off the shelf equipment and replacement parts keep jobs on track.

SAFETY

With no job site quarantine needed, it is safe for other trades to work during installation. Install ECOSEAL Plus and insulate the home in the same day.

CONSISTENCY

ECOSEAL Plus provides quick and safe installs ensuring cost-effective, on-time job completion.

WORLD OF IMPROVEMENT

WE PROVIDE SUPPORT AND TRAINING TO INSTALLERS ACROSS THE GLOBE TO ENSURE THEY ARE UP-TO-DATE WITH THE BEST INSTALLATION TECHNIQUES.

We don't just manufacture insulation; we work to deliver energy efficiency by working with legislators to develop the right building regulations, and also by ensuring that installation is easy and effective. For us, that includes providing regular, hands-on training to installers. In some of our training locations this training also generates professional development points.

Knauf Insulation's national training centre in Lannemezan, France – the Ecole de l'Isolation™ – offers courses such as installation of blowing wool, exterior thermal systems, flat roof insulation and internal wall insulation solutions. Since it opened in 2012, the 700m² practical studio has offered a variety of real-life renovation scenarios that have been recreated to allow installers to practise installing our solutions in a way that maximises their performance. Furthermore, the school's courses are certified and audited by CERTIBAT, the certification organisation in France dedicated to the construction industry.

It's a similar story in Visé, Belgium, where our Large Scale Laboratory provides training and support to installers. In the 400m² facility, multi-materials and multi-products systems of insulation can be set up to replicate the reality of a site scenario. The training offers insight into the latest installation techniques and helps develop new systems and accessories to achieve the best energy saving performance. Trainings vary from our new Kventi pitched roof solution, our JetSpray blowing wool for awkward crawl spaces and even a full rain test to investigate the watertight properties of a membrane after its installation.

In North America the focus is again on maximising the performance of our products and helping those who use them do their job better.

"We have many years of experience and knowledge within Knauf Insulation and it's a privilege to pass it on," says **Scott Miller**, Director of **Knauf Academy** in North America. *"For external contractors this might mean anything from helping them install more effectively or understanding how our products can contribute to a specific building code that has changed,"* Scott says. Courses are held on site or at the academy in Shelbyville, Indiana, but plans are also in the pipeline to offer on-line training modules.

In Germany the Knauf Group holds biannual 'Werktage' events for installers that showcase expertise and the best ways to apply the company's products. At the fourth annual 'Werktage' in 2014, almost 19,000 people attended events held in Mainz, Magdeburg, Stuttgart, Hamburg, Nuremberg and Dusseldorf. During the events the latest innovations, trends and new systems were the subject of practical demonstrations and endurance tests organised by experts from across the entire Knauf Group, including Knauf Insulation. Installers, dealers and architects could experience products and systems in action and join lectures about the latest construction trends such as façade insulation or fire safety.

This commitment to delivering installation knowledge and support, so that installers can not only install insulation but deliver a better performance and therefore energy savings, is present across many other countries where we operate. See our local websites available through www.knaufinsulation.com/group-websites for more information.



"The course really opened our employees' eyes to the demands of a construction site, the importance of air-tightness in buildings and ways of anticipating installation problems. They now feel better prepared to meet the needs of the RT2012 (French energy efficiency regulation) and carry out good quality work on site. In fact they often have a better understanding of airtightness than the architects they are working with."

Daniel Parent, founder of **Parent Plâtrerie**, an installation firm, sent five employees for training at our Ecole de l'Isolation™ in France.

The 'Ecole de l'Isolation™' in Lannemezan (France) offers different trainings on our solutions.
knaufinsulation.fr/ecole

FROM ACQUISITION TO → INTEGRATION

A YEAR AFTER THE ACQUISITION OF GUARDIAN INSULATION WE SEE HOW WELL THE INTEGRATION HAS GONE

When the company acquired Guardian Insulation in 2014, Knauf Insulation dramatically increased its footprint in the United States and now employees over 1,500 people across 18 sites.

Driving the acquisition was the philosophy that although Knauf Insulation and Guardian Insulation were strong individually — together they would be unbeatable.

So a year after the acquisition what is the verdict on the integration of the two companies?

First and foremost, the integration instantly doubled our North America network bringing our energy saving solutions closer than ever to millions of new and existing American customers.

“By optimising the new network, we have cut the kilometres shipped in 2015 by 7.8 million compared to before the acquisition,” says **Eric Kowalewski**, Knauf Insulation’s Vice President of Operations.

That distance is the equivalent of driving to the moon and back 10 times or driving round the world 195 times. It’s also a reduction that saves a staggering 2,840 tons of CO₂ emissions.

As well as being more sustainable, the new network is also good for business. *“The US market offers a lot of potential,”* says **Mark Andrews** CEO of Knauf Insulation North America. *“There is a lot of growth and we are perfectly positioned to capitalise on this”.*

Of course, behind the scenes there have been major initiatives to ensure that this is not a hollow promise, particularly in the area of technology.

Jon Pereira, Senior Vice President Corporate Engineering and Special Projects has been working intensely since the acquisition to bring Knauf Insulation technologies and efficiencies to the former Guardian facilities.

“The collaboration between facilities has been incredible, by bringing two technology platforms together we are all learning and creating facilities that are even more efficient,” he says. *“Former Guardian employees are very excited about the technology from Knauf Insulation and now have the tools to do their jobs to the best of their ability.”*

The most important technological development has been the introduction of our revolutionary binder, ECOSE Technology, at key sites across the country following major investment in new highly advanced manufacturing processes.

Plants that once produced traditional ‘yellow’ Glass Mineral Wool are now manufacturing our renowned ‘brown’ Glass Mineral Wool with ECOSE Technology. This revolutionary formaldehyde-free binder technology is mainly derived from rapidly renewable materials and is without acrylic.

The new manufacturing processes also ensure plants operate in a way that is more energy efficient and environmentally responsible than ever before. For example, the amount of recycled glass or ‘cullet’ that will be used to create energy-saving Glass Mineral Wool in North America in 2015 is expected to be 160,000 tons.

Major improvements in utility use across the plants – such as new lighting systems – have also led to significant energy savings with an incredible 11.25 million kWh saved during 2014 and 2015.

New employees welcomed by Knauf Insulation colleagues: Mike Bonfield, Chad Suhr, Kathy Neeb, Steve Neff, Steve Blackmer



Adding a further dimension of sustainability is the fact that Knauf Insulation products are compressed allowing a reduction in the number of shipping journeys required. Furthermore, the company uses 41% of recycled plastic for packaging in North America compared to 20% in 2014.

Of course, beyond the technological advantages of integration, there have been positive human factors. New friendships have been forged and Knauf Insulation’s ‘hands-on’ approach, that gives individuals the freedom to take ownership of projects and move them along quickly, has also shaped a refreshing culture change for former Guardian employees.

This has been reinforced by the rollout of our Knauf Values and Code of Conduct as well as trainings across departments leading to a genuine sense of “I am Knauf” for those who joined the company in August 2014.

“Knauf Insulation’s market share has jumped to in excess of 20%. Contractors, distributors, engineers and people who are looking for partners in the long term now see Knauf Insulation as a driving force in the US.”

Mark Andrews,
CEO of Knauf Insulation North America

Knauf Insulation’s North American footprint in 2015:

12

LAMINATION
FACILITIES

6

GLASS MINERAL WOOL
MANUFACTURING
PLANTS

1,500

EMPLOYEES

- Knauf Insulation plants
- New Knauf Insulation plants

SILVERCOTE OUR NEW LAMINATION BUSINESS

In 2014, Knauf Insulation acquired Guardian Insulation, including its lamination business now known as Silvercote. Throughout 2015 Silvercote has been resetting its North American facility footprint, so that it can be better located in areas with growing demand for its tailored insulation.

“These facilities will be located so that we can better serve high customer demand,” says **Jeff Chastain**, President, Silvercote & Vice President, Sales – OEM. *“We are also establishing a new research and development facility and examining new markets and new channels.”*

Silvercote manufactures laminated systems insulation for steel and wood frame buildings including made-to-order, high-quality, faced and unfaced blankets. The company also produces high quality retail products, such as water heater jacket insulation, pipe wrap and duct wrap for today’s energy conscious consumers.

Knauf Insulation has always been customer-focused meaning that Silvercote was an easy fit.

“We are very focused on creating customer value as 85% of our business is made to order,” says Jeff. *“We provide everything for a comprehensive insulation systems solution.”*

The integration into the Knauf Insulation family has also been smooth thanks to its similar approach to helping customers, architects, installers and even specifiers achieve the best performance, from markings on the insulation to Certification Training Courses.

“All insulation system components are clearly marked, numbered and cut to fit to ensure that installation in the field is as fast, easy and efficient as possible to avoid wasted material and time,” says Jeff.

On top of an aligned market approach, integration is successful thanks to Knauf Insulation’s people approach.

“People are our most valuable asset and that is something that was made clear by Knauf Insulation from the beginning. The integration process has been relatively smooth through upfront honest communication and the fact that actions – particularly investment – are speaking louder than words” says Jeff.

SILVERCOTE KEY FACTS

2014
JOINED KNAUF INSULATION

174
NUMBER OF EMPLOYEES

12
LAMINATION FACILITIES
IN THE US AND CANADA

PRODUCTS
LAMINATED METAL BUILDING
INSULATION, METAL BUILDING
INSULATION SYSTEMS

SPECIALTY
RETAIL PRODUCTS

WWW.SILVERCOTE.COM

CONTINENTAL SHIFT

Knauf Insulation is enjoying significant expansion across many countries in Asia Pacific, but with plans for further growth in Australasia, Korea, Japan and other parts of South-East Asia, the best is yet to come.

Knauf Insulation is consolidating its reputation as one of the fastest growing insulation companies in the world with significant sales growth for Glass Mineral Wool in Australia, New Zealand, Korea and Singapore as well as plans for a major new plant in Johor Bahru, Malaysia.

In each of these markets, there is a common factor: the quality of our Glass Mineral Wool has raised expectations for insulation. That’s why installers, builders and architects are asking for Knauf Insulation products because they appreciate its superior benefits and outstanding value.

Demand for energy efficiency in buildings is still in its infancy in many countries in the region but several governments are taking positive steps toward improving the situation.

In Japan, following the nuclear disaster in Fukushima, there is increased emphasis on energy efficiency to reduce reliance on nuclear energy and expensive energy imports. As a result, the Japanese Government has implemented programmes to encourage higher levels of insulation.

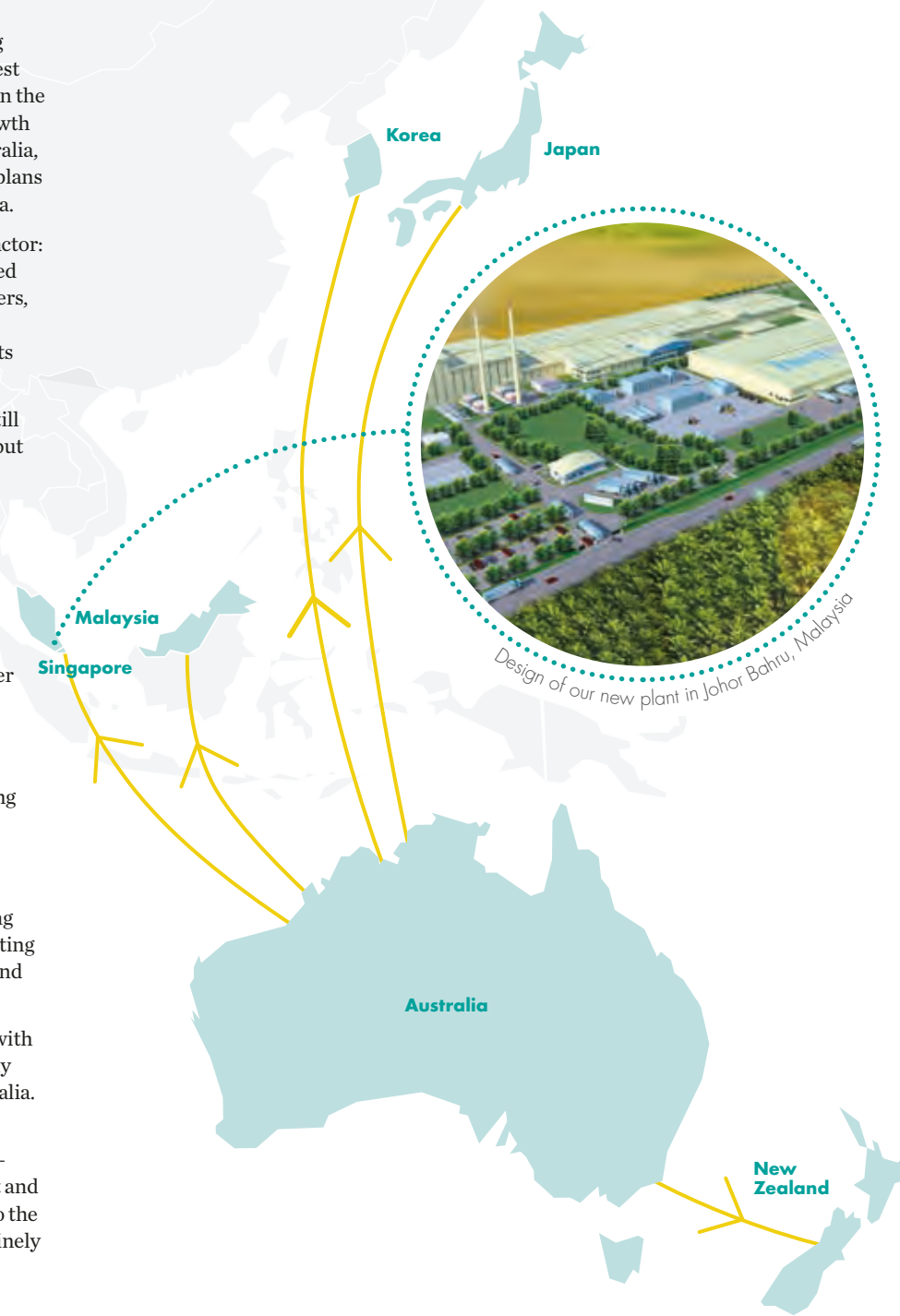
In Australia energy costs have increased by nearly 60% in the past four years¹. As a result, homeowners are demanding higher performing insulation in new construction homes and also embarking on DIY projects to upgrade existing homes.

While energy efficiency is the key factor driving demand, there is also growing evidence indicating that well insulated buildings can reduce demand on health services.

Our Glass Mineral Wool products, combined with our unitised compression packaging are hugely popular across Korea, New Zealand and Australia.

The sharing of worldwide expertise that has contributed to our great growth in the region – from sales and marketing to technical support and everything in between – is a great testimony to the teamwork the company now enjoys on a genuinely global scale.

¹Australian Government, Department of Industry.



MOVING STORIES

Internal candidates filled 29% of key jobs at Knauf Insulation in 2014. Increasingly, more and more of our colleagues are relocating to another region or department with everyone enjoying the benefits of the move. We recognise that internal mobility builds a better company and better people.

Those that move within Knauf Insulation - from one region to another or from one department to another - are often described as 'silo-breakers' bringing new approaches, fresh ideas and a willingness to learn from others.

For the person making the move, there is a unique opportunity to learn new skills, explore the excitement of a new culture and the chance to grow professionally in a fresh environment.

For the company, 'silo-breakers' become catalysts for new ideas offering the chance to approach business challenges with a fresh perspective as well as providing expertise and experience from one place that could prove invaluable in another but without the difficulty of building the company knowledge from scratch.

As the stories on these pages show, this may mean the sharing of knowledge acquired at Knauf Insulation Process

Excellence Programme with other plants; offering unique experience of trials, processes and equipment from the United States with European counterparts; offering a fresh new management approach or sharing best practice learned at one plant with colleagues in another.

And, of course, recruiting key positions internally is a win-win for everyone. The company is appointing someone with internal knowledge, contacts, who is already trusted and professionally proven, while for the 'silo-breaker' the move offers a great chance to grow both personally and professionally.

The stories behind every 'silo-breaker' may be individual, but each person offers the same advice: "If you're given the opportunity to move departments or even countries - go for it! It's a decision you'll never regret."

JOB CHANGES IN 2014 INTERNALLY SOURCED POSITIONS

OVERALL VACANCY SOURCING

13%
Internally sourced positions

JOB CHANGES

5%
Job changes related to key positions

KEY POSITIONS

29%
Key positions filled internally



SAMAR SUDHAKAR • PROCESS ENGINEER
BELGIUM → UK → FRANCE → GERMANY

"During his last position Samar had 'Green Belt' training as part of the Knauf Insulation Process Excellence Programme and his experience of Lean & Six Sigma methodology has proved to be a great help to us in the hot end area."

Matthias Gaertner, Process Engineer, Bernburg, Germany

What motivated you to change?

I like the challenge of a new project from both a high level and plant level. My training has given me the access - both central and local - to get all the information I need to tackle an issue. I also wanted to be familiar with all departments and to build a strong network and support system.

What did you learn?

Even though at all plants we make the same product with similar machines and similar technology, the way the whole thing comes together is totally different. The key thing I learnt is to somehow get the tools and resources I need to get my project done.

MATTHEW REVERCOMB • PROCESS DEVELOPMENT MANAGER
UNITED STATES → UNITED KINGDOM



"The technical knowledge and practical experience of trials, processes and equipment from our plant in the US that Matt has shared with us has been invaluable."

Camilo Medina, Hot End Process Leader, Visé, Belgium

"Matt's experience and expertise coming from Knauf Insulation US always provides us with fresh insight."

Jonathan Molyneux, PPD Manager GMW, St Helens, UK

What motivated you to change?

I wanted to take advantage of the opportunity that Knauf Insulation was offering to me to learn from other plants and countries. I saw this as a great chance to gain new tools and resources to help the company and my career down the road. In terms of my personal life, it was the perfect time to do a three-year assignment.

Any cultural differences you found striking?

It took time to become proficient at using the Queen's English rather than my American English. There are still times that I have to ask someone to explain what they are talking about. Still, my daughter - who is three - has developed a very nice British accent.

What advice would you give to others in your situation?

If an opportunity arises and fits with your personal and professional life - do it! You won't regret it.

BABETTE LOIJENS • BUSINESS DEVELOPMENT PROJECT MANAGER BLOWING WOOL
NETHERLANDS → BENELUX → BELGIUM



"Babette was highly motivated and had the right skills. Not only is it important to nurture people internally by offering them new challenges but the company also benefits considerably from the sharing of their expertise and experience from one Knauf Insulation region or market to another."

Kris Hofmans, Operations Director, Western Europe

What challenges did you face and overcome?

I'm a very straight-talking Dutch person who was used to a Dutch environment where everyone voiced opinions directly and vocally. I've learned to be more diplomatic and sensitive to group dynamics when getting my point across.

What did you learn?

I'm a lot more flexible than I thought - I've learned more about my weaknesses and how to more effectively focus on my strengths such as project management or analysis.

What advice would you give to others in your situation?

Just go for it. Change is good. Even changing departments allows you to learn new things. It's also beneficial to Knauf Insulation and your colleagues because getting to know more aspects of the work provides better understanding and more opportunities for process improvement between departments.

Laurent Peeters, HR Director, Western Europe



ESAT ÖZDEMİR • MAINTENANCE LEADER AND ENERGY MANAGER
TURKEY → BELGIUM → TURKEY

“The value of a silo-breaker like Esat is his network within the company. Esat can help people find the right contact to address an issue.

Also by moving someone internally from a project team to a plant team as opposed to bringing in someone externally, he was aware of everything used during the construction and commissioning phase. This was a huge support for training and induction.”

Erkan Ucok, Plant Manager, Eskesehir, Turkey

“Thanks to his previous Knauf Insulation experience, Esat came to an Energy Manager role with a project mindset already in place. This is a huge asset. He’s seen what other Knauf Insulation plants deal with and this experience adds value.”

Berin Onur, Group Energy Manager

What challenges did you face and overcome?

I took the opportunity to learn as much as possible and also force myself to learn the skills I needed for my next career move. It felt intense at times, but it was worthwhile.

Any cultural differences you found striking?

I was surprised to see everyone – managers and engineers – on the Visé project eating together at lunch like old friends. That was nice.

What advice would you give to others in your situation?

It’s a great opportunity to learn. Take the chance.

MILAN ANDJELKOVIC • PLANT MANAGER
SERBIA → SLOVENIA



“If people are moving within the company that sends a positive message out to everyone. It shows experience is appreciated and valued. The company also benefits from the sharing of this experience.”

Tihomir Civkaroski, General Manager Balkan countries, Cyprus and Malta

“As a result of Milan’s previous Knauf Insulation experience his approach is very systematic and that is very valuable for a plant of this complexity.”

Matjaz Ljubec, Project Manager R&D, Slovenia

What challenges did you face and overcome?

A new organisation, new flow of information and new channels of communication.

What did you learn?

OEM offers great opportunities to bring innovation to life. This is down to the regular exchange of information between the work and sales teams that develop new products to react quickly to market demand. This is a recipe for success.

What advice would you give to others in your situation?

My personal advice is just jump in. Sometimes it’s difficult to leave a comfort zone, but by doing this you learn your limits. It’s the best way to challenge yourself. The rewards – both professionally and personally – are worth it.

FABIO STAFFOLANI • SALES DIRECTOR
ITALY → UNITED STATES



“Fabio came to the US to run sales for a portfolio of products that requires a lot of technical expertise and a deep understanding of Knauf Insulation and its values. The ability to hire from within allowed the US team to dramatically reduce the learning curve that would have been required if we had hired from outside.”

Eric Kowalewski, Vice President Operations, North America

“Fabio tackles projects in a new energetic way and leaves his mark by challenging the status quo. Diversity and independence are important to the North American organisation to outperform targets we have been given. The team enjoys working with him and he is reliable partner in business.”

Barbara-Maria Loth, Vice President Organisation & People Development, North America

What challenges did you face and overcome?

The challenge was to create good relationships with my direct reports, the sales team and the key departments in the organisation quickly. Usually acceptance doesn’t happen because of your job title, but rather through personal engagement and a willingness to listen and learn.

What did you learn?

From day one you must feel you’re in charge, even though somebody else is actually running your new business.

Any cultural differences you found striking?

I still have to wrap my head around why people eat dinner at 5.30-6pm in this country. At that time restaurants are closed in Italy!

What advice would you give to others in your situation?

Embrace change without prejudice and enjoy a completely new personal and professional life. It can be daunting with the wrong mindset. I appreciate that change is sometimes against human nature – it’s incredibly exciting though.

NURTURING TALENT

A sustainable company is built on a sustainable workforce and that means developing talent within the company.

At Knauf Insulation two important initiatives are helping to achieve this – the People Review Process and the Trainee Programme.

The Trainee Programme gives young engineering graduates six months of training in Visé in Belgium followed by a year working in another plant and then a further 12 months in a different facility. With Knauf Insulation bases in the UK, France, Russia, Czech Republic, Turkey and the UAE, trainees have the potential to enjoy a broad range of experience. This experience is then enhanced by specialisation in areas such as product and process development, plant maintenance or production.

The Trainee Programme also incorporates the Knauf Insulation Process Excellence (KIPE) that through a combination of detailed theory and practical project management gives participants key insight into best manufacturing practices. By incorporating this expertise into their daily lives and sharing their knowledge with colleagues, these trainees become important centres for process improvement and culture change with the company.

Another important initiative is the People Review Process that is designed to identify talent and generate a dialogue between Human Resources, line managers and individuals to examine and nurture a person’s potential beyond their current role. This aims to ensure solid succession planning and also enable key people to become the effective entrepreneurial leaders that will drive the company’s success in the future.

TRY MY JOB

It’s often hard to appreciate what it takes to do a job until you actually try it out for yourself.

With this in mind, colleagues at our Krupka plant in the Czech Republic organised ‘Do You Want To Try It?’ – a unique job swop event offering employees the chance to shadow the work of colleagues in different departments.

The aim was to gain a better insight into how individual jobs contribute to the complexity of the plant as a whole as well as offering the possibility for colleagues to explore new career opportunities.

A total of 20 people shadowed colleagues in a wide range of positions that included CE operator, traffic coordinator, shift leader, plant secretary, production planning, warehouse logistics and even the position of plant manager.



LEARNING FROM EXPERIENCE

Safety is the responsibility of everyone at Knauf Insulation. Small changes to behaviour can make a big difference.

50%
REDUCTION
OF LOST TIME
ACCIDENTS
IN 2014



You can have the safest equipment in the world, but it's only as safe as the person who is operating it," says **Renaud Lemoine**, Group HSE Manager Systems & Processes.

"Safety starts and ends with individuals. Does that person know how to operate that piece of equipment? Do they know how it works? Has that person been trained in its use and can they identify a risk situation if necessary?"

In other words, behaviour is critical to creating a safer workplace. It's been a key focus of Knauf Insulation throughout 2014 and 2015.

Behaviour workshops, monthly reports, a renewed and stronger focus on the investigation of incidents combined with a new online system to record the causational factors of incidents and the sharing of key lessons learned are all gaining momentum with the aim of achieving the company's goal of zero harm and midterm target of cutting 'lost time accidents' (LTAs) by 50% by 2020 against a 2010 baseline.

GLOBAL REDUCTION OVER THE YEARS LOST TIME ACCIDENTS (LTAs/1M hrs)



"Safety is double-sided. If someone is handling a situation in an unsafe way is it his fault or the supervisor's? The answer is both. Safety is everyone's responsibility."

Jef Snackaert,
Knauf Insulation's Group HSE Director

The approach is paying dividends. In 2014 the number of LTAs was reduced by almost 50% to 7.58 from 14.42 in 2013.

Our focus is geared towards having people taking ownership of their behaviours to make the workplace a safer place for everyone.

"So how do you begin to change behaviour? Gradually, with a great deal of patience and with the involvement of everyone," says Jef Snackaert, Knauf Insulation's Group HSE Director.

"It took about 30 years to get to a stage where people instinctively put on their seatbelt when they get into cars," he says. *"At first they were reluctant, but for the next generation it became second nature, that is where we want to be with safety at Knauf Insulation – where it's just a natural part of everything we do."*

For example, there has been a strong focus on doing 'root cause analysis' (RCA) of accidents. This has created 'a lot of heat' and has 'not always been pleasant' but it has to be done and plans are now underway to roll out RCA training workshops for 60% of the company by the end of 2015, completing the process by 2016.

All key findings and lessons learned from RCA investigation are summarised in a one page HSE Alert. It identifies actions to be taken by the site where the accident happened as well as actions for other sites in order to prevent repeat accidents of a similar nature.

In 2014, for the first time, the company established a set of 'expected behaviours' for every scenario that could impact on safety. A pilot workshop in Cwmbran, Wales, was held to establish the 'gap' between these expected behaviours and the day-to-day behaviours at the plant in order to establish a set of actions to close the gaps. By the end of 2015 it is expected that 50% of plants will have hosted these 'Gap Analysis Workshops'.

"Getting to those expected behaviours requires the commitment of everyone from management to shop floor," says Jef. At every level the expected behaviours relate to four categories: Following standards, Communication, Risk management and Involvement.

"Using interactive workshops we find out which behaviours are common practice and which are not, we then crunch the data to get an overall picture and then set about finding solutions."

These solutions might be as straightforward as implementing a quick team meeting and making time for it on a shift. *"Often solutions are simple but their impact can be considerable,"* says Jef.

In Krupka, Czech Republic, **Petr Bohuslav** Operator saw the RCA procedure as a change, but definitely one for the better. *"It's hard going through a root cause analysis process, especially after an incident in your own plant. But when you realise how powerful the process is and when you know you are making your plant and other plants safer, you have to get on board and support it,"* he says.

PUTTING UP A BARRIER FIRE

**GERMANY, CROATIA AND SLOVAKIA
ARE TAKING MAJOR STEPS TO IMPROVE
FIRE SAFETY BY INSTALLING FIRE
BARRIERS IN BUILDINGS.**

*An increasing number of European countries
are demanding the introduction of fire
barriers in buildings to improve fire safety –
more countries need to follow their example.*

In Germany building fire safety has come under the media spotlight in recent years particularly after several headline fires including one in Frankfurt where 21 people were injured.

“More than 70,000 people are killed or injured by fire in buildings every year across Europe,” says **Barry Lynham** President of the campaign group **Fire Safe Europe** (FSEU) and Knauf Insulation’s Director of Strategy and Communication. *“Now we are seeing more and more countries demanding – as a minimum – that fire barriers are installed on buildings to secure a fire safe environment.”*

These moves are to be welcomed and Knauf Insulation calls on other countries to follow the examples of Germany, Croatia and Slovakia and improve the fire safety performance of their buildings.

In December 2014 there was a major breakthrough in the improvement of building fire safety performance in Germany.

Deutsches Institut für Bautechnik (DIBt), an institute that provides technical advice to the German government, recommended that *“at least three”* fire proof barrier ‘strips’ should be installed on buildings with external thermal insulation systems.

Spokesman for the **Frankfurt Fire Service**, **Markus Röck**, told Insulation Matters: *“The recommendation by the DIBt is a step forward but we would obviously prefer to see no flammable material on a building façade. Most fire fighters prefer zero risk.”*

Germany is not alone in tackling the issue of fire safety by introducing barriers to make buildings safer.

In Croatia, following campaigns by groups such as the **Croatian Association of Fire Protection**, it is now mandatory to install non-combustible external insulation after a height of 11 metres on all new buildings and those being renovated.

“We are beginning to see a renovation revolution across Europe as a result of increasing awareness and it is vital that we deliver proper fire safety from day one, particularly in public buildings,” said **Juliette Albiac** Managing Director of FSEU. *“That means the right materials installed from the beginning. In the long term it is in everyone’s interest. We will all have safer homes, offices, schools and hospitals and will all be assured that the best performing safety materials will give us greater protection if a fire starts in these buildings.”*

In Slovakia, the **Association of Preventative Fire Safety** along with other interested groups, helped draw up proposals to introduce more fire safe materials during building renovation.

From 2016 external insulation systems applied to existing buildings will need to have 20cm fire barriers above each floor and large-scale fire testing will become mandatory after 2018. The fire barriers will also become mandatory for insulation thicker than 100mm, essentially to be applied throughout all renovation due to tightening U value requirements as of 2016.

“The introduction of fire safety barriers in buildings in Germany, Croatia and Slovakia will undoubtedly reduce the risk of fatalities. Other countries need to follow their example before it’s too late.”

Juliette Albiac,
Managing Director, Fire Safe Europe

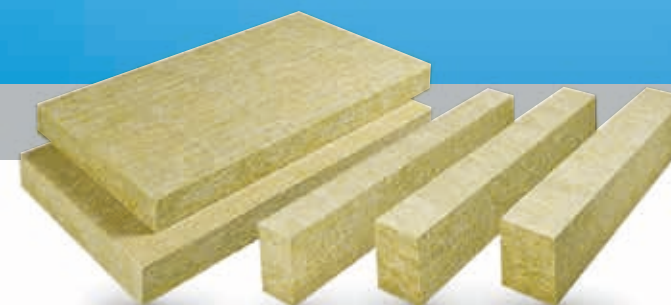
May 2012
Frankfurt, Germany
A façade fire in a building caused 500,000 euros of damage.

It’s what’s on the outside that counts!



Knauf Insulation’s External Wall Insulation, made from Rock Mineral Wool, acts as a shell. Protecting your property from the elements and helping to retain the warmth on the inside. Whilst in warmer climates it can also help to maintain a cooler internal environment.

At the same time, it still saves energy and offers exceptional acoustic and fire performance.



www.knaufinsulation.com

KNAUFINSULATION
it's time to save energy

CAMPAIGNING FOR CHANGE

Knauf Insulation campaigns to keep energy efficiency and building fire safety issues at the heart of public debate across the world.

● AUSTRALIA

WHAT? GREATER NATIONAL AWARENESS OF ENERGY EFFICIENCY AND THE IMPORTANCE OF INSULATION

HOW? Through TV marketing, public awareness campaigns, online videos and the website thinkinsulation.co.au, we continue to reinforce the message that Australians are wasting billions on air-conditioning every year to keep cool.

● CROATIA

WHAT? MAKING CROATIAN BUILDINGS MORE FIRE SAFE

HOW? It is now mandatory to install non-combustible external insulation above a height of 11 metres on all new buildings and those being renovated following three years of campaigning by Knauf Insulation and fire experts.

● CZECH REPUBLIC

WHAT? TAKING ACTION TO MAKE RENOVATION A REALITY

HOW? Along with the Czech Republic Green Building Council (GBC), we have been deeply involved in a €2.5 million Horizon 2020 BUILDUPON Project designed to empower 14 European GBCs to work with national governments and stakeholders to improve renovation roadmaps and make renovation a reality.

● EUROPE

WHAT? UNLEASHING THE POWER OF EUROPE'S SECRET WEAPON

HOW? Throughout 2014 we campaigned intensively to highlight the massive benefits of energy efficiency and building renovation for delivering long term jobs and growth and greater energy security. Our teams from across Europe campaigned hard in Brussels and with policy makers for a more ambitious target on energy efficiency in the 2030 Climate and Energy Strategy.

● FRANCE

WHAT? KEEPING RENOVATION AT THE HEART OF NEW LEGISLATION

HOW? Knauf Insulation has been working to ensure that building renovation, fuel poverty reduction and the role of green roofs such as Urbanscape are kept centre stage during discussions of the Energy Transition for Green Growth Bill in France. It was adopted in July 2015 establishing a 34% energy savings target, which is substantially more ambitious than the target of 27% at EU level.

● GERMANY

WHAT? SUPPORTING A MULTI-BILLION-EURO ENERGY EFFICIENCY STRATEGY

HOW? Germany is rolling out a €80 billion National Action Plan for Energy Efficiency which includes tax incentives for energy-related building renovations, 'topping up' a CO₂ building renovation programme and boosting competitive tendering for energy-saving projects. Knauf Insulation is helping to drive action plan progress at every level.

● SLOVAKIA

WHAT? UNLOCKING MONEY FOR RENOVATION AND IMPROVING BUILDING FIRE SAFETY

HOW? We've successfully promoted a new renovation programme for single-family homes with up to €30 million earmarked by the Government to subsidise this segment in 2016. Preferential loans for the energy efficient renovation of multi-dwelling apartment buildings will also provide an option to write off up to 15% of the principal to inspire higher energy efficiency ambition. In addition, new external insulation systems applied to existing buildings must now have fire barriers above each floor, along with other measures to limit the spread of façade fire.

● SLOVENIA

WHAT? INSPIRING NEW WAYS TO SAVE ENERGY AND FIND MONEY FOR RENOVATION

HOW? We've supported government in its process to implement a law which requires the yearly renovation of 3% of public buildings and to put into place solutions for financing the renovation process.

● TURKEY

WHAT? GENERATING GREATER AWARENESS OF BUILDING ENERGY EFFICIENCY

HOW? We are working with energy consultants Ecofys and national insulation association IZODER to initiate a cost-optimal calculation of U-values in Turkey in line with the EU's Energy Performance of Buildings Directive. Turkey aims to reduce national energy use by 20% by 2023.

● UNITED KINGDOM

WHAT? KEEPING ENERGY EFFICIENCY AT THE HEART OF UK ENERGY POLICY

HOW? Knauf Insulation has created the Local Authority Energy Index, a platform for local councils to share best practice in helping to reduce energy bills. The second edition, published in 2015, covers 100 Councils representing more than half of the UK population and more than half of energy used. We also continue our support for the 'Energy Bill Revolution' campaign that seeks to reduce fuel poverty.

● USA

WHAT? HIGHLIGHTING HOW ENERGY EFFICIENCY CREATES JOBS

HOW? By the end of 2014 there were three million more Americans in work than a year before. But the best could be yet to come. The American Council for an Energy Efficient Economy calculates that 60,000 jobs could be created in the US for every exajoule of energy saved (an exajoule is 10¹⁸ joules or approximately 1% of North America's annual energy supply).

WE CAN WORK IT OUT

The energy efficient renovation of buildings is an engine to power Europe's economic growth. It creates jobs and releases billions to create more. It's time for governments to turn the key.

RENOVATION CAN
CREATE

900,000-1,800,000

JOBS IF

EUROPE CUTS ITS ENERGY BILL BY

€200 BILLION

Luis Bravo Gonzalo



Luis Bravo Gonzalo, a construction site foreman, lost his job along with millions of others when the financial crisis swept through Spain.

The company he worked for collapsed overnight and the 37-year-old found himself unemployed. Luis didn't find another job for four years.

In December 2013 he completed his Knauf Insulation SUPAFIL training and now works as an approved blowing wool installer for a company called Reintec in Pinto, a town close to Madrid.

Schemes like this are not only putting Luis and many like him back to work, but they are helping customers reduce their heating and cooling energy bills by up to 50%. This has a compound effect; with fewer unemployed, fewer public resources are being spent on benefits, money is coming back to the countries in the form of taxes, plus customers reduce their fuel bills so that they can either cool or warm their home to the minimum healthy level of 18 degrees, but by paying less. It's win-win all round.

"My hopes for the future? I just want to keep working," Luis says.

In Spain alone over 100 people have completed the Knauf Insulation Blowing Wool training programme since it began in 2012. It is expected to train up to another 30 blowing wool installers in 2015, but that number could be even higher if there was a bigger demand for energy efficient homes.

Spain is not the only country where people like Luis are getting a new chance in life thanks to building renovation programmes. In Slovakia there will be 700 more people like Luis enjoying a new job with the new government programme for energy efficiency renovation of single family houses (see story on page 32).

When renovation initiatives are scaled up they drive incredible levels of growth. According to the 2015 Energy Productivity and Economic Prosperity Index there could be between 900,000 and 1.8 million more workers enjoying a new job if Europe's energy bill was cut by €200 billion.

And buildings offer the biggest potential to save this energy because in Europe they are responsible for 40% of energy use. The vast majority of these buildings are energy inefficient and up to 90% of those standing today are expected to be still around in 2050.

"Making buildings more energy efficient is the perfect way to power growth across Europe and create hundreds of thousands of jobs," says Knauf Insulation's CEO Tony Robson.

"There is no downside. As a result of renovation we save energy, help the planet and save billions in energy bills that can be used to create employment for people like Luis."

That money is desperately needed. The 2008 financial crisis may seem like history, but its chill still freezes the hearts of many of Europe's economies.

"The crisis has taken its toll," said Jean-Claude Juncker when he took over as President of the European Commission. "More than six million people lost their job during the crisis. Youth unemployment reached record highs and several of our Member States are still far away from sustainable growth and adequate levels of investment."

When Juncker became President he immediately put jobs and growth at the heart of the European Commission's new agenda, boosted by the mobilisation of an Investment Plan which intends, among other things to mobilise at least €315 billion in additional investment across the EU over the next few years through a dedicated European Fund for Strategic Investments (EFSI).

The European Commission in its communication on a strategy for an Energy Union described EFSI as *"an opportunity to leverage major investments in renovating buildings. Investments in this area can provide great returns in terms of growth and jobs"*.

And the plan is already helping to deliver increased investment in energy efficiency. However, the actual volume of renovation projects coming through for financing is still far too low. There is an estimated gap of up to €100 billion per year to 2020 to meet the EU's 2020 goal of increasing the energy efficiency of the EU economy by 20% and a fivefold increase in current investment levels is needed to close the gap in the buildings sector according to environmental think-tank E3G.

Fighting for investment to be prioritised for renovation projects and rolling out projects through a Europe-wide renovation programme is going to be key.

"I believe a considerable percentage of this money should be ring-fenced for investment in the renovation of buildings across Europe to make them more energy efficient because of the incredible potential for jobs and growth," says Robson.

The European Commission's own in-house science service agrees. A 2015 report by the Joint Research Centre described energy renovation of existing buildings as a 'win-win' option for the EU economy as a whole. ►

SLOVAKIA SUCCESS AS 700 NEW JOBS CREATED

Up to 700 new jobs are to be created and at least 5,000 families every year will have their lives transformed thanks to a campaign driven by Knauf Insulation to unlock at least €30 million in annual funds to pay for the energy efficient renovation of single family homes.

Plans are also in the pipeline to release millions more in funding for multi-family dwellings that could see the creation of a thousand more jobs and energy-saving renovation for thousands more families every year.

Knauf Insulation and groups united under the Buildings for Future platform worked for 18 months to campaign for an incentive programme to renovate single-family homes.

“Existing soft loans proved to be unattractive to this segment, causing renovation rate and quality to remain low,” explains **Peter Robl**, Public Affairs Manager, Knauf Insulation Slovakia.

But now, following the campaign, a government social package has been approved that includes a 30% subsidy for the energy efficient renovation of single-family dwellings.

“In 2016 alone the budget of up to €30 million will create more than 700 new jobs, generate €40 million in additional public budget revenues and will lead to the unlocking of a further €70 million invested from private capital,” says Peter.

Now the campaigners with Knauf Insulation are working to release millions more to help renovation programmes for thousands of multi-family buildings.

Soft loans, available since 1996, have successfully driven the renovation to almost 3% of these buildings every year for between 22,000 and 25,000 families a year. Unfortunately, demand was exceeding the money available by 40% on average and slowing growth. Energy efficiency improvements were also not achieving their potential.

“So, we made the business case and approached the government to use allocated European Structural and Investment Funds to leverage private capital to increase the number of multi-family dwellings being renovated in the long term.”

“We are still fine tuning this financial instrument to make it happen but we expect to create a thousand new jobs as a result as well as renovate the homes of up to thousands of families a year,” says Peter.

In the meantime, the government has agreed to write off up to 15% of a multi-family renovation loan's principal if it meets ambitious energy efficiency requirements.

in 2015

► The report also concluded that *“an EU renovation plan is needed to phase out inefficient buildings from the European building stock while ensuring a sustainable economic recovery of the building sector.”*

The report also stated that in 2011 the construction sector had been responsible for 7% of the EU's gross domestic product and employed more than 11 million people. When the crisis swept through Europe some countries lost up to 60% of their construction jobs. However, because specialised construction activities such as renovation and energy retrofits account for two thirds of building jobs, there is a huge opportunity to grow this sector.

“Small and medium-sized enterprises are the economic drivers of construction in Europe particularly when it comes to the renovation of buildings,” says Robson. *“Investing in energy renovation of existing buildings would significantly increase the contribution made by these companies to growth and job creation in the EU.”*

“An EU-wide renovation plan would also drive innovation,” says Robson. New skills, new products, new approaches and – as a result – new jobs would all be needed to be developed for different buildings in different climates and environments around Europe if a serious commitment is made to save energy.

One action we are taking is working with the European Insulation Manufacturers Association (EURIMA), whose members include Knauf Insulation, to fight for a major portion of the €31.5 billion European Fund for Strategic Investments (EFSI) to be dedicated to energy efficiency and building renovation.

“Energy efficiency investments are among the most societally attractive investment choices for their delivery... the amount and type of jobs they bring, their positive energy security, resilience and environmental benefits and their direct fiscal returns” says **Jan te Bos**, Director General of EURIMA.

JUST THE JOB

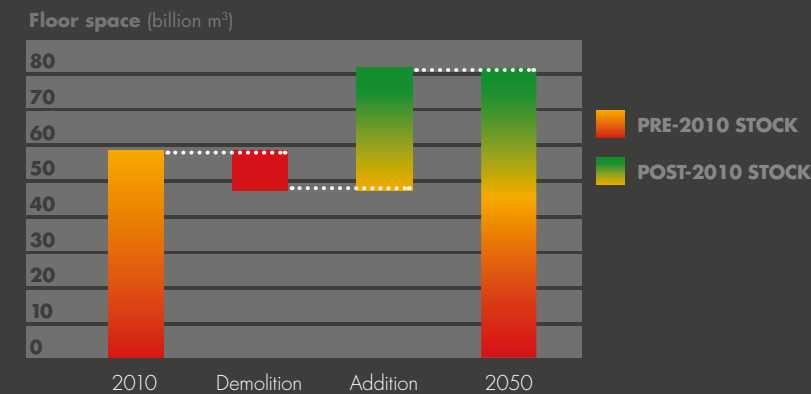
“Energy efficiency, if applied to existing as well as new buildings, could generate thousands of new and local jobs throughout Europe. It would reduce unemployment, generate much-needed investment, contribute to improved energy security and bring important environmental benefits.”

Bernadette Ségol,
General Secretary of the European
Trade Union Confederation

WHY BUILDING RENOVATION IS SO IMPORTANT

75-90%

In OECD countries, more than 75% of the current global building stock will remain in use in 2050.

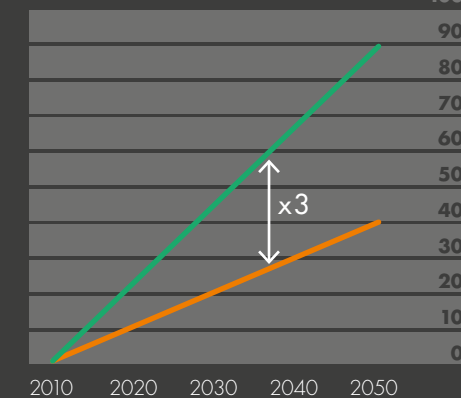


Source: IEA publication “Technology Roadmap, Energy Efficient Buildings Envelopes”, 2013

x3

the EU rate at which renovation needs to occur for emissions goals to be met by 2020.

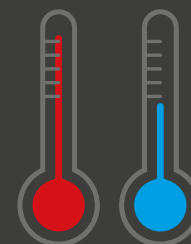
— CURENT RENOVATION RATE
— RENOVATION RATE THAT IS NEEDED



Source: EEFIG Final Report covering Buildings, Industry and SMEs, 2015

19%

of the EU population live in homes that are not comfortably cool in summer.



11%

of the EU population were unable to keep their homes warm in winter.

Source: European Commission “Energy Renovation - The Trump Card for the New Start for Europe”, 2015

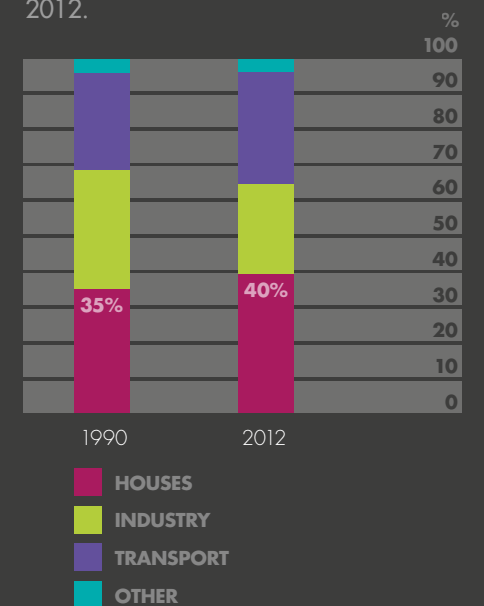
75%

75% of today's EU buildings were built with no or minimal energy-related requirements.

Source: EEFIG Final Report covering Buildings, Industry and SMEs, 2015

35 → 40%

EU Buildings are responsible for 40% of our energy consumption. This has increased by 5% between 1990 and 2012.



Source: EEFIG Final Report covering Buildings, Industry and SMEs, 2015



UNITED WE STAND

Plans for a European Energy Union are an opportunity to make energy efficiency in buildings a priority.

The European Energy Union strategy is an opportunity to put energy efficiency in buildings first.

A key initiative of European Commission President Jean-Claude Juncker was to reform and reorganise Europe's energy policy in a new European Energy Union with the aim of giving everyone in the EU secure, affordable and climate friendly energy as well as help to end fuel poverty.

In February 2015, the European Commission presented its five dimensions of the Strategy Framework for the Energy Union: security of supply; a fully integrated internal energy market; energy efficiency; emissions reduction as well as research and innovation.

The principle of 'Energy Efficiency First' – ensuring energy efficiency comes before the exploration of new energy sources – will also be applied and Knauf Insulation is fully behind the concept.

And where better to start than buildings?

As a bloc, the EU spends more than a billion euros a day importing fossil fuel, much of which is used by buildings, mainly for heating and cooling.

A total of 75% of Europe's housing stock is inefficient and buildings across the EU have huge potential for energy efficiency gains, reducing the EU's energy import bills, reinforcing energy security as well as slashing household and business energy costs.

"The efficiency sector is ready and waiting to eclipse shale gas as the biggest source of energy saved in this case," said **Barry Lynham**, Knauf Insulation's Director of Strategy and Communication.

Speaking at the Lisbon Council in 2015, **Miguel Arias Cañete**, **European Commissioner for Climate Action and Energy**, stressed that improving building energy efficiency is a key priority of the Energy Union, stating: "Investments in insulation are amongst the most profitable for citizens and industry today."

Good news for us. So what next?

The next step is to walk the talk by making buildings part of the wider energy infrastructure. Europe needs a solid strategy for renovating buildings, it needs to provide EU Member States with the necessary capacities and it needs to improve access to finance.

The European Commission has pledged to ensure that access to finance will be made easier through the EU's "Smart Financing For Smart Buildings" scheme and funds are already available to EU Member States through the European Fund for Strategic Investments (EFSI).

This is a promising start. Let's hope it's a start that delivers.

WALKING THE TALK: SCOTLAND'S ENERGY EFFICIENCY PLEDGE

Scotland is one country where energy efficiency in buildings is a national infrastructure priority.

In 2015, the government made energy efficiency the cornerstone of a national infrastructure plan. This new programme will help all residential and non-residential Scottish buildings achieve a good energy efficiency rating.

"A new Energy Efficiency Programme will offer support to all buildings in Scotland over the next 15 to 20 years to help them achieve a good energy efficiency rating and play a pivotal role in reducing energy bills, fighting fuel poverty and tackling climate change," said **Aileen McLeod**, Climate Change Minister of the Scottish Parliament.

"Heating and cooling our homes and businesses costs £2.6 billion a year and accounts for half of Scotland's greenhouse gas emissions. Energy efficiency is clearly vital to meeting our ambitious climate change targets, which is why action on energy is a key focus."

TEN WAYS TO UNLOCK MONEY FOR RENOVATION

Money doesn't flow easily towards the optimal energy efficient renovation of buildings as there are often too many obstacles in the way. A new report finds fresh solutions to an old problem.

When it comes to investment in the energy efficient renovation of buildings, money likes its path to be obstacle free.

It likes government support, enforced laws and regulation, the transparent sharing of data, market demand as well as streamlined systems and expertise it can trust.

Without these things money tends to flow somewhere else. Somewhere easier.

And that's a tragedy, because in the European Union, for example, buildings squander €500 billion in wasted energy. Every year.

A lot of lives could be transformed with that cash and a lot of jobs could be created in building its solution. So, how can these obstacles to renovation finance be removed?

Recently, the **Energy Efficiency Financial Institutions Group (EEFIG)** – an organisation convened by the **European**

Commission and the **United Nations Environment Programme and its Finance Initiative (UNEPFI)** – looked to find solutions.

Its recommendations, announced by the EEFIG's rapporteur **Peter Sweatman**, CEO of **Climate Strategy & Partners**, included the following:

1 ENFORCE THE RULES

Money for energy efficient renovation will be released if existing building regulations are strongly enforced and harmonised across the EU.

Example: A strong commitment from Member States to an ambitious transposition of the Energy Efficiency Directive and Energy Performance of Buildings Directive.

2 LOOK TO THE FUTURE

Opportunities must be taken to make buildings more energy efficient in the future through a combination of new regulations and incentives.

Example: EEFIG suggests incentivised energy efficiency upgrades for those wanting to sell or rent an inefficient property (with minimum performance standards for rentals) and innovations such as on-bill repayments and a rating system to provide transparent assessment of the risks of energy efficient renovation projects.

3 SHARE THE DATA

Accurate, standardised and easily accessible building energy performance data that can be shared means better investment decisions.

Example: Consumption data collected by energy companies should be made available to customers, building owners and accredited third parties to make it easier to plan renovation projects.

4 ENERGISE MANAGERS

Take pity on poor public building managers who often can't carry out energy efficiency renovations because of public accounting, reporting and procurement obstacles.

Example: Any hurdles that stop these managers making quality decisions in the long-term interest of their buildings should be resolved.

5 OFFER HOME HELP

Homeowners need incentives to buy into energy efficient renovation and these can be funded from the societal benefits of the work.

Example: If people have tax incentives to make their homes more energy efficient or a clear view of new future regulations, they will carry out a renovation. Align this increased demand with support from, for instance low-cost bank loans, and renovation grows with employment and building value.

6 PAY FOR EXPERTISE

European funds don't offer a bottomless pit of money. So the cash that is available should be used as effectively as possible.

Example: Use funds to provide reliable technical and project development support for key energy efficiency renovation projects. Money likes a solid business proposal before making a decision to invest.

7 SHOW DON'T TELL

No decision maker spends money without first understanding the return on investment.

Example: When building managers don't have access to easy-to-understand data about the financial return of energy efficiency measures in their building it's not a priority. Solid evidence and data, easily accessible, make compelling business cases.

8 SPREAD THE WORD

Accurate energy and financial performance data must be measured and verified after renovation projects.

Example: Provide energy investment case histories that show the connection between value increases and the money spent on energy efficiency.

9 IMPROVE STANDARDS

Processes and standards for buildings labels, energy performance certificates and energy codes should be constantly improved.

Example: Feedback from financial institutions and the market as energy efficiency policies become a priority in EU countries will be vitally important.

10 STREAMLINE PROCESSES

Investors like standardisation in any process that involves money.

Example: Standardisation of everything from legal contracts and procurement procedures to measurement, verification and valuations in universally recognised models adds volume to the energy efficiency market and lowers costs.

Visit www.eefig.eu to download the full report or follow #EEFIG on Twitter

BUILDING THE BUSINESS CASE

Stephen Hibbert, Managing Director at ING Commercial Banking, Structured Finance, Global Head of Energy & Carbon Efficiency, discusses the importance of the EEFIG report.

From a bank perspective what are its key recommendations?

Transparency, longevity and certainty in policy, combined with the consistent application of regulatory requirements – be those incentives or penalties. The need to raise the level of awareness of the business case, taking into account the wider commercial returns to investors beyond simple pay-back periods and valuable additional societal benefits, such as energy security, emissions reduction and improved health.

To what extent is transparent standardised data significant?

To improve the level of confidence of investors, both the primary risk takers and the providers of third-party finance, the availability of market and technical data and its presentation according to commonly recognised protocols will have a significant positive change on the perception and management of risk.

Why are co-finance facilities also important?

An essential catalyst to mobilise private sector funding and create a new financial asset class will be the development of co-financing facilities between public and private finance providers. These must be tailored to policy goals and regulatory frameworks, give access to technical assistance and provide for different levels of risk participation.

What can banks learn from this report?

That banks need to gain a much deeper understanding of the full range of issues and what is driving the needs of our clients and policy makers. Also to give them a better explanation of our own position and concerns. The EEFIG approach of getting a wide and varied group of stakeholders to collectively agree on common definitions of terms and then to develop the surveys and jointly analyse the results was an eye-opener.

WE KNOW WHAT YOU NEED

We saw the demand for increasing information about product performance coming a long time ago. Green Building Rating Systems require a level of information about product performance that manufacturers are barely coming to terms with themselves. So where should you turn for all this information?

Knauf Insulation is at the cutting edge of assessing product performance. Technical properties, like thermal performance, reaction to fire – no problem.

Specifiers have had databases with this information for decades. But when it comes to information about product environmental performance, things can get complex.

We've started gathering all this information in one place. We're also working on a consistent approach to information on product environmental performance to help specifiers and the industry. Why? Because this information is shaping the future.

Legislation in countries such as France and Belgium is already starting to demand greater information about environmental performance and Green Building Rating Systems (GBRS) such as LEED, BREEAM, HQE and DGNB are increasingly giving it value.

In these systems, points are now being awarded for products with an Environmental Product Declaration (EPD) – a document that forensically examines the environmental impact of a product at every stage of its life cycle.

So where can specifiers find information about these EPDs?

At the moment many countries have their own EPD provider, with its own database. There are thousands of EPDs published on national databases, and the number is growing rapidly.

However, this is an issue for specifiers and manufacturers. What if we sell a product in another country? Is the EPD from one country recognised in another?

Knauf Insulation is providing a service to the market in two ways: firstly, we're pushing for the new 'Eco Platform EPD', which has been developed and based on a European standard, EN 15804. It has a common verification base in 11 countries and is a first step towards full recognition across Europe – although some countries still demand additional requirements.

Secondly, we're dedicated to providing a service to the market by offering information on product environmental performance in a range of formats. *"In addition to EPDs, we offer Environmental Fact Sheets (EFS) that distill the essence of an EPD, as well as Life Cycle Assessment results sheets, into a simple digest as well – so that specifiers can deliver the performance they need and reap the value of a sustainable building"* says **Jean-Pierre Pigeolet**, Knauf Insulation's Sustainability Technical Manager.

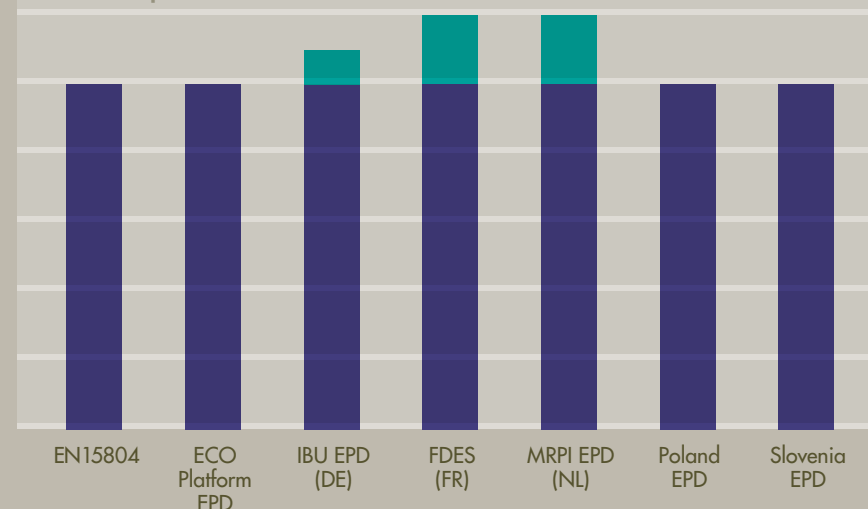
Our services for specifiers include:

- EPDs for more than **80%** of our **Glass Mineral Wool** products and for **50%** of our **Rock Mineral Wool** products
- A published EPD in **six weeks**, wherever our innovative data collection process has been implemented
- An online **Urbanscape tool** that forecasts the performance of our green roof solution
- Knauf Insulation **Green Building Rating Factsheets** for each of our product groups
- For our **Technical Solutions** products, a new online tool that provides environmental impact information. ►

EN15804 is the European Standard for Environmental Product Declaration for construction products. Here is how national EPDs compare:

- Specific requirements such as additional indicators, health requirements or specific dataset
- EN15804 standard

Levels of requirement



AS A SPECIFIER, YOU MAY HAVE MANY QUESTIONS ABOUT THE SUSTAINABILITY OF A PRODUCT. WE HAVE THE ANSWERS...

HOW LONG WILL KNAUF INSULATION NEED TO PROVIDE AN EPD?

Our EPDs can take as little six weeks to produce

"I needed an Environmental Product Declaration for Knauf insulation Naturboard FCB. When Knauf Insulation told me that they were going to create it for me, I thought it would take months, but they told me it would take only weeks. I had the EPD in time for the proposal which was for the Lysaker Polaris project in Norway and that meant I also gained BREEAM Green Building System points."

Renārs Milašs, purchasing manager at **Husvik SIA**, Latvia.

Creating an EPD is complicated and time-consuming because it involves collating huge amounts of data and hundreds of calculations followed by intensive verification. The process used to take six months or more but now we've reduced the time it takes to process and publish an EPD to as little as six weeks, wherever our innovative data collection process has been implemented.

DO YOU HAVE EPDs FOR ALL YOUR PRODUCTS?

We have EPDs for 50% of our products

"I needed an Environmental Product Declaration for a Knauf Insulation product. Firstly, the Knauf Insulation website gave me full access to numerous EPD data and enabled me to fulfil my specification. Secondly, it was an EPD that was representative, not a generic EPD covering the whole product range."

Garry Vaughan, Head of Procurement & Sustainability Supply Chain & Commercial, **ForViva**, United Kingdom.

Our EPDs now cover 80% of our Glass Mineral Wool products and 50% of Rock Mineral Wool products – an incredible achievement towards covering our entire product range. We continually update this list of EPDs, which is a collation of EPDs published on national databases.

HOW MANY POINTS IN MY GREEN BUILDING PROJECT DO I GET IF I USE YOUR PRODUCTS?

Our factsheets show how to earn points in Green Building Rating Systems

"Sometimes it's not clear how many Green Building Rating Systems points a product can contribute towards a project. But with the factsheets on the Knauf Insulation website, it is now really clear. I achieved more points than I thought with Knauf Insulation Naturoll 035 product."

Raimonds Keirans Technical director, **EKOTEH BUVE Ltd**, Latvia.

Our factsheets, available on our website, include a full breakdown of the points awarded by LEED and BREEAM for Knauf Insulation's Glass Mineral Wool, Rock Mineral Wool and Wood Wool products.

Each document takes specific definitions from the relevant green building scheme category, explains how Knauf Insulation can contribute and the points available.

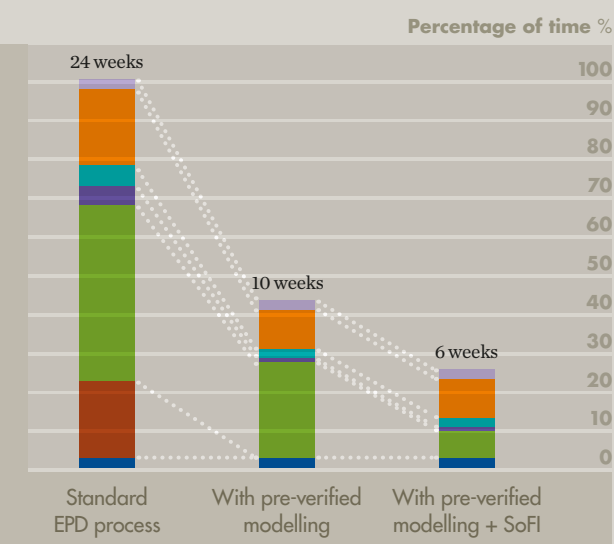
For example, under Glass Mineral Wool with ECOSE Technology and LEED certification, Knauf Insulation products can contribute towards points for 'recycled content' as manufactured with up to 80% of recycled content (glass cullets). LEED also offers points for local product sourcing and a map outlines how these points can be obtained in different areas.

Under BREEAM, which places emphasis on the full life cycle of buildings, under 'life cycle impacts', Knauf Insulation products contribute points for the availability of EPDs.

We also accommodate BREEAM NL (Netherlands) where there is a specific category for volatile organic compounds that doesn't exist in the BREEAM International scheme. Our ECOSE products with no added formaldehyde can contribute maximum points in that category. ▶

How we've shortened the process to get your EPDs quicker

- Scoping
- Modelling
- Data collection
- Calculation
- Drafting text
- Verification
- Publication



► CAN I CALCULATE THE BENEFIT OF THE URBANSCAPE PRODUCT INSTALLED ON MY BUILDING?

Our online tool shows how Urbanscape improves performance

"I'm always looking to quantify the savings made from products I choose. It's the way the industry is going, and sometimes you might get a subsidy if you can show savings. Looking at this tool, this is a fantastic way to prove savings." **Miha Lečnik**, architect in **APLAN**, Slovenia.

The new tool, at <http://info.green-urbanscape.com>, is based on green roof research at **Ljubljana University's Mechanical Engineering Department** and enables installers, specifiers and customers to see how the green roof system will perform in a range of countries and climates in comparison to the performance of a regular roof on the same building in the same place.

It can also calculate the impact on environmental issues such as rainwater management and heat island effect where air is cooler around a green roof. In the Dutch city of Rotterdam, for example, heavy rains from June to October put a strain on the sewage system.

<http://info.green-urbanscape.com/download-free-greenroof-performance-evaluation-report>

Knauf Insulation ECO Platform EPDs, along with other Knauf Insulation EPDs, are available on our website. www.knaufinsulation.com/en/environmental-product-declaration



DO YOU PROVIDE ENVIRONMENTAL IMPACT INFORMATION FOR PIPE INSULATION PRODUCTS?

Our new online tool provides environmental impact information for our Technical Solutions

"With more knowledge comes the power to make better decisions. The new online tool offered by Knauf Insulation that provides detailed environmental impact information about insulation solutions for HVAC systems brings something completely new to the market and anticipates increasing customer demand as well as possible changes to future regulations." **Kelly Achten**, Project Manager, **CEGELEC nv**, Belgium.

We have launched a new online tool that provides detailed environmental impact information about our insulation solutions for heating, ventilation and air-conditioning (HVAC) systems at the click of a mouse.

The tool available at <http://www.knaufinsulation-ts.com> distils products' environmental impact information based on data collected over its lifecycle – from the sourcing of its material, manufacturing, installation, use and ultimately disposal – into an easy to understand website that calculates results instantly.

Customers select the type of products they wish to use along with quantities and job site location, and the online tool calculates the lifecycle assessment – or LCA – of each product, as well as the total for the order.

At present the system offers data about specific products created by Knauf Insulation's Technical Solutions division for HVAC applications.

The data provided by the tool is based on a verified EPD that forensically examines the environmental impact of a product at every stage of its lifecycle.

The online tool marks a breakthrough for sustainability at Knauf Insulation and is the next stage of evolution in providing comprehensive data to customers quickly.

www.knaufinsulation-ts.com/en/life-cycle-assessor

DO YOU HAVE BIM OBJECTS FOR KNAUF INSULATION PRODUCTS?

We're preparing for Building Information Modelling

"Building Information Modelling or BIM is becoming increasingly important in the industry. It is a significant help that important Knauf Insulation products are now available in the most commonly used BIM formats." **Kristina Surna** Purchase and logistic manager, **SELVA BUVE Ltd**, Latvia.

Building Information Modelling – or BIM – gives specifiers the power to generate data-rich three-dimensional digital impressions of what a building could look like.

It dynamically takes into account the interrelations between all parts of the building and allows specifiers to assess and simulate factors that will influence building and maintenance costs, timing and environmental performance and impact.

Importantly, it enables architects, engineers and integrated construction companies to show clients details of a project – such as recycling data about an entire building – and make significant digital changes before a single stone is laid.







This new way of designing, constructing and managing buildings is re-shaping the industry – and Knauf Insulation is ready to help.

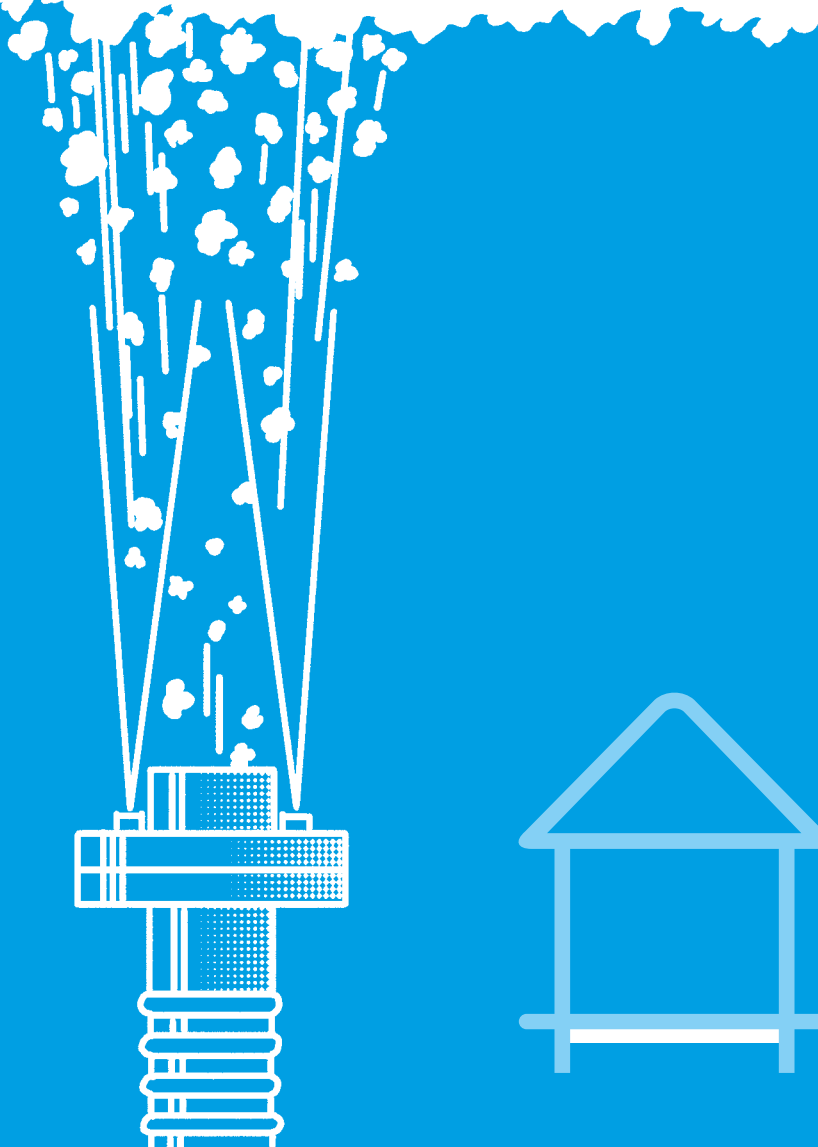
Knauf Insulation has published product and system BIM libraries in Europe and North America, with a wide range of products in a variety of file formats.

And this is important because specifiers increasing use BIM in their projects and they expect suppliers to be able to provide the right input files. These files contain real-life scientific data about materials, products and systems – such as reaction to fire, and thermal and acoustic insulation performance among many others – making the model a much richer and accurate representation of the future building.

Leading Knauf Insulation innovative products like the green roof solutions Urbanscape and SUPAFIL blowing wool are now available in the most commonly used BIM format files, on the relevant countries' Knauf Insulation websites.

THE POWER OF BLOWING WOOL, THE EASE OF SPRAY

-  EASY APPLICATION
-  COST EFFICIENT
-  EXCELLENT THERMAL PERFORMANCE
-  NO DISRUPTION
-  INTERIOR COMFORT
-  INCREASES THE VALUE OF YOUR PROPERTY



The JetSpray System is a complete blowing wool insulation solution for crawl spaces and basements beneath houses.

JetSpray Thermal is applied only by approved professionals using precision spraying technology for quick results without disturbance to residents.

With the JetSpray System even difficult places are relatively easy to reach.



KNAUF INSULATION
it's time to save energy

JETSPRAY

CONTRIBUTING TO GREEN BUILDING RATING SYSTEMS

Our contribution to Green Building Rating Systems such as BREEAM and LEED were deciding factors in the choice of our products. Here are two examples of how Knauf Insulation products contribute to greener, more sustainable buildings.

OFFICE BUILDING, NORWAY

Certification achieved

BREEAM - Very Good with energy class B in line with the BREEAM NOR (Norway) environmental standard.

Product used

SUPAFIL Frame into 2,200m² of wall space.

Project

25,000m² Norwegian office development by construction giant Skanska. The new four-storey building for oil company Aibel in the city of Bergen features 900 office spaces, a gym, cycle parking and a naturally illuminated atrium at the heart of the building.

Challenge

To fill every “nook and cranny” in the wall.

Solution

Isomax Energi AS installed SUPAFIL ensuring a smooth and efficient installation process in timber frame construction to fill the voids.

Benefits

SUPAFIL reduces the environmental impact of the building and is manufactured with up to 60% recycled glass.

“Isomax Energi AS in Norway is a nationwide blowing wool insulation contractor that only uses SUPAFIL. As a result of the high quality of the solutions we provide, we have enjoyed a strong working relationship with the international construction company Skanska since 2011. This continuing collaboration between our companies has led to many prestigious projects in Norway, including the Aibel building in Bergen.” **Tore J. Barstad**, CEO, Isomax Energi AS.

PUDASJÄRVI SCHOOL CAMPUS, FINLAND

Certification achieved

BREEAM International New Construction certification scheme.

Product used

SUPAFIL Frame, 9,700m² of floor space.

Project

School to open in summer 2016. It will accommodate around 800 students in four buildings.

Challenge

Air quality in public buildings, particularly schools, has been a priority in Finland for years and led to many large-scale school renovations across the country. From the point of view of the city of Pudasjärvi, it was important to find the best partners for the project.

Solution

All the building materials were chosen in line with strict life cycle analysis as well as their contribution to BREEAM.

Benefits

SUPAFIL can contribute up to 32 points in the BREEAM certification scheme in a range of categories including energy efficiency, CO₂ reduction, acoustic quality, recycled content and air quality. It also matched the overall cost-value thinking of the project as well as the importance being attached to life cycle assessment. Environmental Product Declarations that chart the environmental impact of a product throughout its life cycle are available for SUPAFIL Frame.

“The indoor air quality problems that have pestered schools for a long time are about to be solved by this project.”

Eero Talala, Technical Director at Pudasjärvi

“Blowing wool is the only way to insulate a building project like this and we have always had good experiences with SUPAFIL Frame. It was the obvious choice.”

Kimmo Similä, project’s site manager



Visit our website to see how our products contribute to points in the various rating schemes, including our LEED and BREEAM documents.

www.knaufinsulation.com/en/sustainable-buildings-and-green-building-rating-systems

RESOURCE EFFICIENCY

DOING MORE,
WITH LESS,
BETTER.

DOING
MORE,
WITH
LESS

We've worked hard to improve the performance of our products, without increasing the resources needed to produce them. Today, one unit of energy used to manufacture a typical Glass Mineral Wool product saves 570 units in its use phase of 50 years, whereas in 2008 one unit saved 489 units, that's 16% more today than six years ago.

We are also working on using less municipal water, reducing packaging; and using compression technology and logistics optimisation so that we need fewer journeys to transport products.

LESS ENERGY



By putting processes and behaviour under the spotlight we've reduced energy use per ton of production by 15.3% from 2010 to 2014. See pages 52-57 for a range of other ways we are reducing the amount of energy used in manufacturing.

Some of our plants such as Skofja Loka have installed PV panels and at Nova Bana we've introduced natural light tube sinks to reduce energy from lighting.

LESS WATER



We mainly use water for cooling. Our cooling system can either be a closed-loop system, meaning we add very little water, replacing only what might evaporate and discharge even less or we have an open-loop system. For other processes using water we're working on ways to reduce use.

LESS PACKAGING



In 2014 we switched to a thinner film used to wrap insulation products, cutting film use by 27.3%, while at Technical Solutions we optimised packaging so precisely that only what is needed for the quantity of product ordered is used.

FEWER JOURNEYS



We transport more product per journey. Our unique processes compress large volumes of product into easily manageable and light-weight packages. This means we need fewer trucks. For example, it takes an 80m³ truck just one trip to deliver 5,760m² of 50mm Mineral Plus.

BETTER

Knauf Insulation follows most of the important International Management Standards for sustainability. We are certified by one of the leading conformity assessment organisations, Bureau Veritas.

ISO 9001

(Quality Management) for all our Europe, Russia and CIS Plants.

ISO 14001

(Environmental Management) for all our Europe, Russia and CIS Plants.

ISO 50001

(Energy Management) for all our Europe, Russia and CIS Plants.

OHSAS 18001

(Health and Safety Management) for all our Europe, Russia and CIS Plants.

INCREASING RECYCLED CONTENT

Increasing recycled content, especially from external sources, is a good thing for everyone. For society it turns waste into something that is good rather than sending to landfill. We've developed technology to better treat our internal waste, but at the same time we do a lot to improve quality and therefore reduce the amount of internal scrap made during the production of our insulation.

UP TO **80%**

Our Glass Mineral Wool is composed of up to 80% recycled glass, such as window glass or, most commonly, glass bottles.

Where recycling is not common practice around a manufacturing plant, for example in the Russian district of Stupino, we set up our own recycling points and now collect hundreds tons of glass that would have gone to landfill every year.

UP TO **22%**

Waste sourced from outside our plants such as steel slag – a by-product of metal smelting – can be used in the manufacturing processes that create Rock Mineral Wool. It's not always easy, impurities can damage the process, but we are seeing some successes such as at our Nova Baňa plant in Slovakia where up to 22% of our Rock Mineral Wool is made from external recycled material.

+ UP TO **35%**

This includes materials from production lines with further processing into briquettes before being used.

+ UP TO **16%**

This includes edge trim from production lines with shredding that is reintroduced into the process. The levels of reused waste varies across the plants but the material we want to increase is external recycled material, while with internal recycled content we're working on improving process and quality to produce less as well as reducing edge trim in the long run.

INNOVATION



In 2009 we introduced a revolutionary new binder that has no added formaldehyde, which we integrated across our entire Glass Mineral Wool product range as well as part of our Rock Mineral Wool product range.

In 2010 Knauf Insulation became the world's first company to receive the coveted Eurofins Indoor Air Comfort Gold certificate for its Glass Mineral Wool with ECOSE Technology.



The environmental credentials of ECOSE Technology products help contribute towards points in Green Building Rating Systems such as LEED and BREEAM. In the new version of LEED (LEEDv4, released in 2013) our Glass Mineral Wool with ECOSE Technology is 100% compliant for the insulation category in Indoor Environmental Quality (IEQ) credit for 'Low-Emitting Materials'.



GLASS

ROCK

THE HEAT IS ON

World leaders need to act now to cut emissions before it's too late.

According to anecdote, if you put a frog in boiling water it will leap out to save its life. But warm the water gradually and the frog doesn't realise the danger. That lack of awareness ultimately proves fatal.

It's not a cheerful story, but isn't that what we're doing to ourselves by allowing emissions to slowly heat up the planet? We're slowly killing ourselves. And every minute we delay taking action, the water heats up another fraction of a degree. Soon it will be too late.

Every time we wait five years the task that we have in front of us gets harder and harder. This is why action NOW is so essential rather than waiting for another five years to fly by.

"In business when you know you have a problem, you sort it out, if you wait it has a tendency to sort you out. We face the same dilemma with climate change; the time to debate the problem is over, it's time to sort it out," says **Tony Robson** CEO of Knauf Insulation.

Under current global emission trends – +2.2% per year between 2000 and 2010 – the rise in average global temperatures will be between 3.7°C and 4.8°C by 2100.

Already climate change is being heralded as freak weather, famines, floods and environmental devastation. If the temperature rises unchecked, that amphibian anecdote becomes a reality for many species, even humans.

In December 2015 world leaders meet in Paris for the 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change – or COP21 for short – to draw up a new international climate agreement to keep on the path of limiting global temperature increases to below 2°C by the end of the century. Governments agreed to the 2°C target in Copenhagen in 2009.

"It has to succeed and countries have to commit to binding emission reduction and bold energy efficiency targets and then back these decisions with political will and serious investment," says Tony Robson. *"If we don't act now we will leave a deadly legacy for generations to come."*

1988

International Panel on Climate Change is established. The COP will be the supreme decision-making body of the convention.

1992

The UNFCCC (United Nations Framework Convention on Climate Change) is adopted to respond to the problem of global warming.

1997

The Kyoto Protocol is signed at COP3 to strengthen the UNFCCC and it legally binds developed countries to emission reduction targets in two periods.

2009

Copenhagen Accord, COP15. A new climate change treaty was not reached and there was a failure to deliver strong commitments.

2015

UNFCCC COP21 process is working towards securing a legally-binding international agreement on carbon emissions to keep the world on a path of below 2°C warming by 2100.

Failure to secure a legally-binding international agreement on carbon emissions would increase the risk of having an average global temperature of 3.7°C to 4.8°C by 2100.

→ Professor **Jean-Pascal van Ypersele**, vice-chair of the **Intergovernmental Panel on Climate Change**

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

→ **Maroš Šefčovič**, Vice President of the **European Commission** in charge of Energy Union

"To be successful, the Paris deal needs to be ambitious, legally binding, verifiable and dynamic."

1988

1992

1997

2009

2015

...2100

IMPACT OF CLIMATE CHANGE

The latest assessment report by the Intergovernmental Panel on Climate Change examined the potential impact of increasing temperatures caused by global warming by 2100. The research features contributions from more than 800 scientific authors from 70 countries and more than 150,000 independent comments. It's findings underline why COP21 matters.

30%

OF SPECIES COULD BE AT HIGH RISK OF EXTINCTION

A total of 20-30% of plant and animal species are likely to be at high risk of extinction as global mean temperatures exceed a warming of 2°C to 3°C above pre-industrial levels. In addition to species loss, increased water heat causes severe decline of coral and a widespread loss of tourism in places such as Australia and Indo-Pacific islands.

10K

DEATHS FROM RUSSIAN HEAT WAVE IN 2010

In densely populated cities, health risks result from increased exposure to extreme heat and poor air quality particularly amongst the old, young and those with respiratory or cardiovascular disease. 2003 saw the hottest summer in Europe in 500 years, claiming the lives of 35,000 people. In 2010 over 10,000 died in a Russian heat wave.

1°C

RISE INCREASES IMPACT ON VULNERABILITY

When the price of food, land and other resources increases, vulnerability increases for those most in need and least able to pay. Without adaptation, local temperature increases in excess of about 1°C above pre-industrial are projected to have negative effects on yields for major crops such as wheat, rice and maize. If yields are reduced international food prices and the number of food-insecure people are expected to increase globally.

29%

INCREASED RISK OF DEATH AND POOR HEALTH

In five regions of South Asia and sub-Saharan Africa by 2050 there is an increase in 'nutritional stunting' an indicator linked to increased risk of death and poor health of up to 29% compared to a future without climate change. Climate change is a threat multiplier that aggravates situations. In areas where resources such as water are scarce, drought increases tension. Where you have tension you have conflicts and possibly wars.

8.7M

PEOPLE AT RISK FROM RISE OF SEA LEVEL

Global mean sea level rise is projected to be between 0.28 and 0.98m by 2100 having a major impact on low-lying cities, deltas, and states. Factor in huge rises from melted Antarctic or Greenland glaciers and the picture gets bleaker. If contemporary rates of sea level rise continue to 2050 more than 8.7 million people will be at risk in 40 deltas, including Mumbai and Dhaka.

X2

RATE OF ARCTIC ICE LOSS COMPARED TO RATE OF GLOBAL WARMING

The Arctic has been warming at about twice the global rate since 1980 resulting in unprecedented ice loss. Some projections state the Arctic Ocean will be ice-free by the end of the century.

15%

OF FARMS AFFECTED BY FLOODING IN FIJI

Flooding, caused by increased rainfall in rural areas, damages crops, causes food shortages as well deterioration of hygiene and the spread of water-borne disease, putting the vulnerable at risk. In 2009 the Fiji flood caused economic loss of F\$24 million impacting 15% of farm households.

Source: Fifth assessment report of the Intergovernmental Panel on Climate Change, 2014

NEW ERA OF ENERGY EFFICIENCY

There has been a major power shift at Knauf Insulation's plants. Now every single employee has the ability to save energy.

Upgrading machinery and investing in new technologies can reap huge benefits and over the years we've seen great results from these investments. But there comes a time when making further energy reductions takes something more, something as simple as how a person operates a machine. And to change this, you need to inspire change in behaviour.

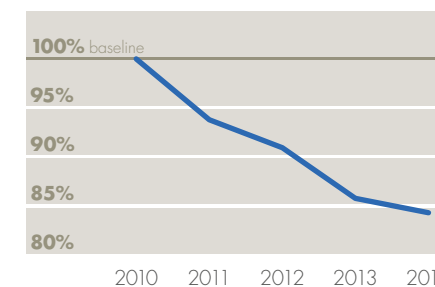
"The fuel efficiency of a car varies greatly according to the way you drive it – small changes in driving behaviour can make a major difference to consumption," says Robert Agnič, Knauf Insulation's Plant Support & Process Development Manager for Rock Mineral Wool in Europe. "It's the same with energy use at our plants. Through detailed analysis we've been able to understand the changes that will make our process run more efficiently. We're driving the same car but in a way that uses less fuel."

This approach to energy management led to impressive efficiency successes throughout 2014, particularly for our Rock Mineral Wool plants. Robert expects to see even more significant improvements in 2015. *"Each plant is now trying to be the most efficient and there is a lot of light-hearted competition."*

"Reducing energy is easy, the most difficult part is to change people's behaviour," says Denis Bremer, Knauf Insulation's Process & Quality manager at St Egidien, Germany. "However, the more our plant colleagues see the benefits of change, the more they trust the new process."

Regarding energy in our other technologies; benchmarking has been carried out across the plants and we have begun extensive Process Quality meetings to examine how we can make all processes more efficient. People at all levels are involved and these ideas have evolved into efficient solutions. At our Glass Mineral Wool plant in Krupka, Czech Republic, intelligent software has been introduced to check energy consumption and production is now monitored by sensors that are controlled by operators (see 'Spotlight on Krupka' on page 55).

GLOBAL
REDUCTION
OF **ENERGY**
OVER THE
YEARS
(mWh)





“Operators are key to save energy. They can make a difference the minute a situation occurs.”

Jan Brázda,
Krupka Plant Manager

SPOTLIGHT ON KRUPKA

Changing behaviour based on reliable data has seen significant energy savings at the Czech Republic plant. And the biggest contributing factor of all? The operators themselves.

What happened at Krupka?

The first step was the installation of smart technological solutions that could measure daily energy use and show operators if they were within the set operating range of an historic best energy usage known as the Energy Target. The energy management system user interface flags up exceptional usage over the target set for any single material manufactured at the Krupka line.

What has changed?

Today, through the system, operators are immediately aware of their impact on energy use. Now if I ask an operator why there was a surge they can explain to me exactly what happened in minute technical detail. In the past that did not happen. This is the added value of the energy management system. Operators know why, how much and how to control.

The system also monitors behaviour?

Absolutely. Not only behaviour, but individual team performance as well. There are four shifts of 14 people each at Krupka led by shift crew leaders. The energy management system revealed that one was out-performing the rest. The ‘best practice’ shift showed a significant difference in energy performance indicators than the average use taken from the other three. Imagine the difference in energy savings if all the shifts were up to the best team performance.

Why are the shifts so different?

There are a variety of factors; the operators might be more pro-active if there is a problem, they might be able to sort issues out themselves and they might ask for help faster than others. Some might stick to identified best operating practice and some believe their setting is the best one. Some are more creative, experienced and have worked out effective routines and tools. The challenge is that these best behaviours and healthy routines are ‘hidden’ in one shift and need to be shared and standardised across all teams to make process stable, predictable and energy efficient.

How is that achieved?

Through conversation and data analysis it is easy to see where there were challenges that caused extra energy use, who was on shift at the time and what action was taken to improve that situation. Behaviour lessons learned from the more efficient shift can be shared with others, and behavioural patterns learned from those that are not as efficient can also be understood and changed.

And there is no sense of ‘division’ as a result of showing one shift is more efficient than another?

No. There are incentives for the entire plant that are based on efficient energy use. If one shift does well everyone benefits. When every shift makes significant progress due to implementing the best energy management routine of the “best in class” shift, there is the prospect of a celebratory dinner. Fun for everyone is driving our continuous improvement culture... but what is driving change is healthy competition between shifts, partnership and our motto: “It’s time to save energy.”

What is the biggest learning to be taken away from this?

Operators are key. By the time management learns of a surge in energy use, that energy has already gone. Operators can make a difference the minute a situation occurs. The leadership or management roles are to provide education, awareness and tools. Energy matters, it is a major part of our manufacturing cost, therefore motivation and recognition for achievements are key.

► However, as with our Rock Mineral Wool bases, improvements continue to be rolled out across our Glass Mineral Wool Plants.

“We have held energy awareness workshops across all the plants to focus on behaviour and carried out energy tours,” says **Berin Onur**, Knauf Insulation’s Group Energy Manager. “Talking to people directly is the best way to collect ideas. Operators have a wealth of experience that they want to share and their input is essential when it comes to cutting energy use.”

Ideas have included modifications to equipment to be more efficient, installing automatic on/off switches; moving operators around to share best practice and using machines at their most efficient temperatures.

“For example, one of our colleagues came up with the idea to stop an electrical motor he was not using for a period of a few hours,” says **Frank Schumann**, Shift Assistant at St Egidien, Germany.

Keeping energy efficiency at the forefront of everyone’s mind is an on-going process, says Berin. “Plant workers themselves are looking at ways that processes can be improved and we are putting in place targets so that we can see progress and they can see the extent of their input.”

“I came to the engineer and said, ‘I have an idea, let’s switch off this motor while it’s not working’. That idea will now add up to significant savings over a year.”

Frank Schumann,
Shift Assistant at St Egidien, Germany



OUR 2014 ENERGY AWARD CHAMPIONS

THE ENERGY AWARDS IN A FEW WORDS

Our energy awards recognise those plants that have demonstrated outstanding performance during the year.

The awards are also designed to share good practice and provide all our energy managers with fresh ideas and inspiration. They also add a level of friendly competition between plants. Škofja Loka won in 2014 because the plant did not have an energy management system in place but within 12 months they had developed a system that continues to run highly efficiently today.

Queensferry was the other winner that year. The energy manager demonstrated great enthusiasm in implementing energy saving measures at every level – particularly in communicating our energy awareness programme.

QUEENSFERRY, UK VERY GOOD ON ENERGY PERFORMANCE



PROCESS AND ENERGY MANAGER **CRAIG DAVIES** DISCUSSES HOW FEEDBACK, INVOLVEMENT AND WORKING TOGETHER CAN MAKE A DIFFERENCE.

WHAT FACTORS CONTRIBUTED TO YOUR SUCCESS?

In 2014 we conducted training for all site employees in small groups. I shared energy consumption and cost information; we discussed previous improvements and had an open conversation about new ideas and areas of energy waste. Queensferry has a very experienced work force and the training generated dozens of ideas all of which were recorded and assessed with actions and progress published on the plant notice board.

TO WHAT EXTENT WAS FEEDBACK IMPORTANT?

It was vital to the teams because they felt involved in improvements and could understand the challenges we faced. Actions included isolating idle machinery and replacing old inefficient lighting, but the main change was to ensure energy use was on everyone's mind – from switching off a light to optimising a fan speed or temperature setting.

HOW WILL YOU MAINTAIN YOUR SUCCESS?

We conduct monthly plant tours during down shifts to check key equipment is turned off – the tour also includes offices – and a scoring system is used to chart improvements. Communicating the results keeps everyone informed and motivated. We also use an energy system that generates huge amounts of process data. With this I can identify areas of significant energy use and take action to optimise efficiency.

ŠKOFJA LOKA, SLOVENIA KNAUF INSULATION'S MOST IMPROVED PLANT



SYSTEM MANAGER **DEJAN GOLOB** DISCUSSES NEW TECHNOLOGY AND HOW TO ENCOURAGE A CULTURE OF CHANGE.

HOW WAS ENERGY EFFICIENCY TRAINING CARRIED OUT?

These were carried out through 'live' presentations as well as online 'e-learning' that focused on energy use, consumption, costs, potential savings, sustainable development and energy efficiency improvement measures with company-wide examples.

WHAT NEW TECHNOLOGY WAS INTRODUCED?

We implemented a system that monitors energy use on a daily basis and compares consumption between shifts and at different process stages. The system allows immediate action to be taken if necessary and helps optimise processes to achieve the highest product quality at lowest prices. The importance of energy efficiency was integrating into production, maintenance and logistics instructions, as well as into trainings.

WHAT CHANGES HAVE BEEN INTRODUCED?

Each sector of the plant is checked every month in rotation for leaks, all actions are recorded and workers trained in leak detection. Meanwhile, gas heaters have been replaced with waste cupola hot water; a new energy-efficient air compressor has been installed and automatic on/off switches for external lighting introduced.

WHAT BEHAVIOURS HAVE CHANGED?

Through awareness training line operators now switch off the parts of line that are not in use and drivers turn off their forklifts when they are not in use. We realized that auto-switch-offs could also be installed to detect these periods of inactivity. We've reached the lowest possible temperature in the shrinkage chambers and the installation of the energy metering system has helped to optimise processes and to reduce energy use. Finally, the maintenance and servicing of heating systems, ventilation and air-conditioning systems has been improved.

HOW HAS PROGRESS BEEN MAINTAINED?

Energy efficiency is integrated into regular 'Hazard Spotting Tours' that are designed to improve health, safety, the environment and now energy efficiency. Key performance indicators are also regularly monitored. Stickers, posters and information on bulletin boards and in Knauf Insulation News all continue to promote the energy efficiency message and proposals to improve energy-saving processes are encouraged through Knauf Insulation Innovations.

CUTTING OUT WASTE

Our rate of waste reduction slowed down in 2014, with technology upgrades and start-ups creating exceptional waste in some plants. But in Rock Mineral Wool sites new waste saving initiatives are making a major contribution to our journey to zero waste to landfill.

ON OUR
WAY TO
2020
TARGET
OF ZERO
WASTE TO
LANDFILL

RECYCLE AND REUSE

Knauf Insulation is cutting out waste from its multi-layer boards... literally.

"The boards are composed of different layers such as EPS, Rock Mineral Wool and Wood Wool," explains Joachim Wiettschnig, Knauf Insulation's Technical Director Wood Wool and XPS. "If they get damaged, rather than sending them to landfill we are using band-saw machines to cut out the different elements to recycle and reuse."

The Wood Wool is now being used internally at Knauf Insulation and the EPS is being returned to original supply companies for reuse. The programme marks an important step in the creation of the circular economy at Knauf Insulation.

"We have launched the EPS and Wood Wool separation programme at Simbach in Germany which is our biggest plant in terms of output," says Joachim.

"With multi-layer boards featuring Rock Mineral Wool we are also removing the Wood Wool and reusing it. Our plants at St Egidien in Germany and Škofja Loka in Slovenia have agreed to take back the Rock Mineral Wool and are also feeding the material back into their production processes."

Denis Bremer has been working at Knauf Insulation for 22 years. During that time the amount of waste he has seen being sent to landfill has been disappearing rapidly.

"Now it's been cut dramatically and the company is working hard to reduce as well as reuse as much waste as possible. In fact, with our new technology at St Egidien we can get it down to zero," he says.

Creating some level of internal waste is still unavoidable but we are looking at opportunities to recycle as well as reduce it.

Measures include selling the iron from side processes to foundries; feeding process dust back into melting processes; crushing waste from Rock Mineral Wool to 'briquettes' for reuse; reusing material cleaned from filters and testing equipment changes to focus on areas where other waste-saving gains can be made.

Changing behaviour has also had a major impact. In the past the amount of 'edge' cut from boards was not measured. This has now changed and measuring has gone hand in hand with reductions.

Thanks to such initiatives, waste from our Rock Mineral Wool plants reduced to less than 800g per m³ in 2014.

Across other Knauf Insulation plants, we saw a varied performance.

"On our way to our 2020 target of zero waste to landfill, we are still making positive progress," says Philippe Coune, Knauf Insulation's Group HSE Manager, Performance and Sustainability. "In Europe in particular we have reduced waste considerably and this is a great achievement. At Knauf Insulation, managing waste is at the forefront of everyone's mind simply because a waste-free future is everyone's responsibility."

We are seeing huge improvements in data collection regarding waste, with this year being the best data set ever. Colleagues are seeing the importance and benefit of good data and how they can manage waste more effectively.

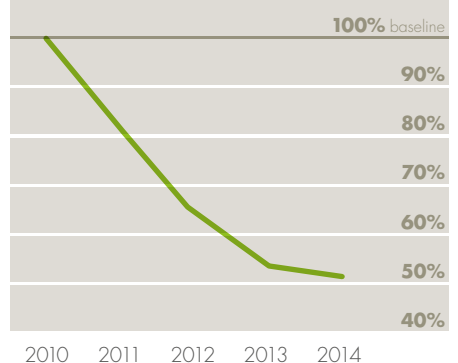
Naturally, however, there have been challenges. Some plants that managed to send zero waste to landfill are looking for fresh solutions as new suppliers who handle waste are now required.

Upgrading technology in some of our new sites has also led to small exceptional increases in waste. For instance, the installation of new equipment in our Turkish plant temporarily produced extra scrap in the start-up phase. Meanwhile in the US, as we integrate Knauf Insulation technology into Guardian sites, following the acquisition last year; there will no doubt be a spike in waste as we run the lines for the first time.

"Overall in Europe, we have reduced waste considerably and this is a great achievement. At Knauf Insulation, managing waste is at the forefront of everyone's mind simply because a waste-free future is everyone's responsibility."

Philippe Coune,
Group HSE Manager

GLOBAL REDUCTION OVER THE YEARS WASTE TO LANDFILL (Ton/m³)





HELPING THE ENERGY EFFICIENT VISIONARIES OF TOMORROW

Knauf Insulation Ukraine was a key sponsor of the **10th Energy Management Olympiad at Kiev Polytechnic** – a competition for students designed to promote energy management innovation.

We sponsored the categories dedicated to energy efficiency and thermal performance of buildings.

Those taking part in the Olympiad will one day significantly contribute to the development of energy independence in Ukraine.

HELP FOR HOSPICE



Staff at our St Helens plant in the UK are actively supporting Willowbrook Hospice – a local charity that offers palliative care to patients suffering from life-limiting illnesses.

A team has helped organise clothes donations to be distributed to their 10 charity shops. A donation box has also been permanently installed at the St Helens site where staff can leave unwanted clothes, handbags and shoes, knowing their contribution will be used to raise funds for the hospice.



LANNEMEZAN BIRTHDAY CELEBRATION

For the fifth anniversary of our Lannemezan plant, we hosted an open day in June 2015 with more than 400 visitors. The open day brought together employees, their families

and our local partners including representatives from local government and notably the local Prefect for the French State in the Department, Anne-Gaëlle Baudouin-Clerc.

Our visitors learned about industrial manufacturing processes and the contribution our products make to maintain a sustainable environment through, for example, the use of recycled glass. They were also able to better understand the wider scope of our economic impact both locally and globally.

SUPPORT FOR YOUNGSTERS



The Shelbyville Boys and Girls Club and the organisation Shelbyville Girls, Inc both in Shelby County were presented with cheques for US\$3,000 each from our North American Headquarters.

At Girls, Inc the donation will contribute to programmes that help female teenagers with fitness, nutrition, community leadership and literacy, while at the Boys club the donation will support activities and better facilities.

FORMER SHADOW ENERGY MINISTER VISITS ST HELENS PLANT



During a visit to Knauf Insulation's St Helens headquarters in the UK, the former **Shadow Energy Minister Jonathan Reynolds MP** saw how energy efficiency is the single most effective means of establishing lasting energy security and improving the warmth of homes across the UK.

"Installing energy efficiency measures in homes is one of the best ways households can get their energy bills under control."

Jonathan Reynolds, Shadow Energy Minister



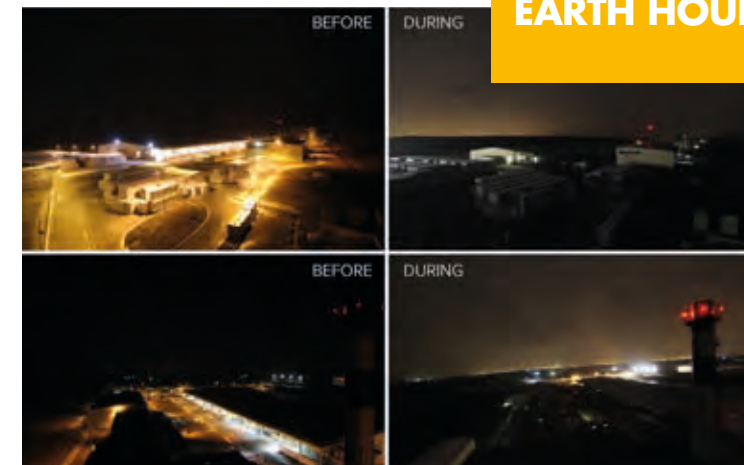
SCHOOL RENOVATION IS A CLASS ACT

Teams from our Belgian Visé plant and Mont-Saint-Guibert offices renovated a 'homework' school for 20 children from under-privileged backgrounds and a supervised centre for youngsters as part of our MAD (Make A Difference) challenge.

Knauf Insulation staff from Visé brought together more than 50 people from local businesses to give the Wade school building a facelift that included wall renovation and replacing lights.

Meanwhile, 32 people from Mont-Saint-Guibert helped redecorate La Fermette, a small house which forms part of a non-profit centre, Le Logis, for children placed there by youth courts to ensure a safe, supervised environment.

RUSSIA'S EARTH HOUR



Our Stupino and Tyumen plants in Russia were able to switch off all their lights for 60 minutes as part of their contribution to Earth Hour.

Earth Hour is an annual event in March that shows how everyone has the power to make a difference when it comes to environmental awareness.

This year's theme was 'Use Your Power to Change Climate Change'. A total of 172 countries and territories as well as 1,400 landmarks took part in the big switch off.

FUN ON THE RUN



Friends and colleagues at our Visé plant, Mont-Saint-Guibert offices in Belgium and Oosterhout plant in Netherlands, recently took part in the Brussels 20km road race.

PEAK PERFORMANCE

A team of 10 from our Prague office has conquered Sněžka, the highest mountain in the Czech Republic. The intrepid team reached the summit in great spirits after a 7.5km trek.

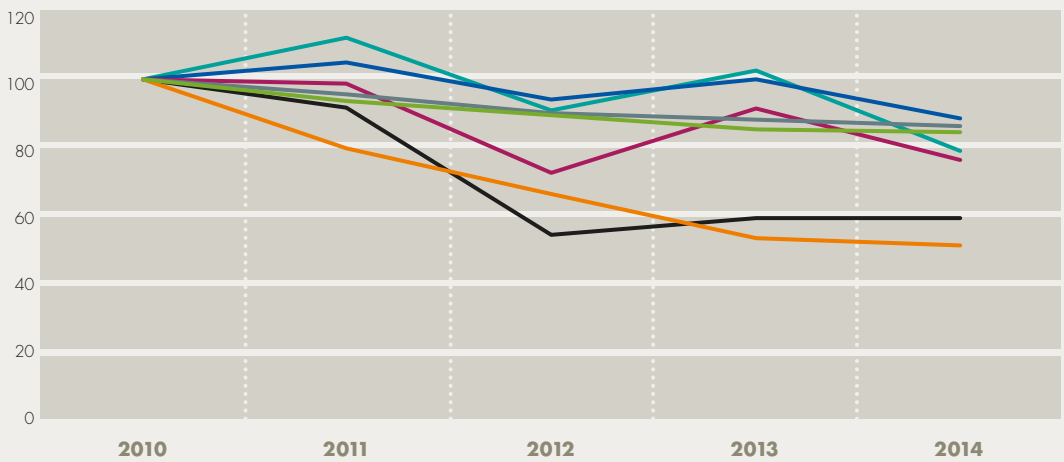


PROGRESS TOWARDS OUR SUSTAINABILITY SUCCESS

We continue to make excellent progress in reducing lost time accidents, remain on track to meet our 2020 objectives for energy use and have reduced emissions significantly.

PROGRESS AT A GLANCE

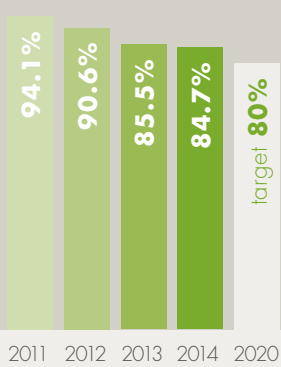
- ENERGY USE
- WASTE TO LANDFILL
- CO₂
- WATER USE
- WATER DISCHARGE
- NO_x
- SO_x



ENERGY USE mWh



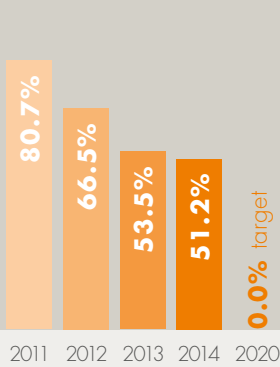
2010 baseline – 100%



↓ **-15.3%**
from 2010 baseline

Thanks to energy awareness programmes we remain on track to meet our 2020 objectives and have reduced energy use per cubic metre of product by 15.3% since our 2010 baseline. Our energy figures are also influenced by specific technologies and locations.

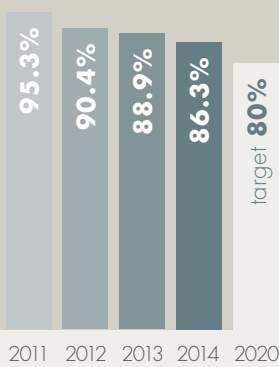
WASTE TO LANDFILL Ton/m³



↓ **-48.8%**
from 2010 baseline

We have reviewed our data collection as we have realised we misreported last year and the correct percentage in 2013 was 53.5%. In 2014, we achieved 51.2%. New plants in Tyumen and Eskisehir also started operating in 2014 and we are now looking into ways of recycling waste from these sites, while at some Glass Mineral Wool plants recycling companies were unable to take all their waste.

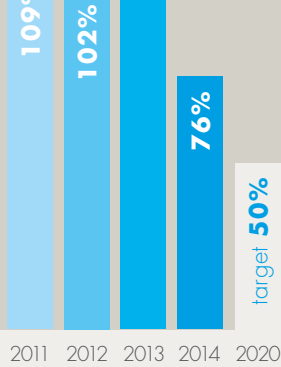
CO₂ Tons/m³



↓ **-13.7%**
from 2010 baseline

Our CO₂ figure is linked to energy use and has experienced a similar trend for the reasons explained in 'energy use' section. We expect to see continued reductions in the amount of CO₂ emitted per kWh of energy consumed as a result of new more energy-efficient technologies.

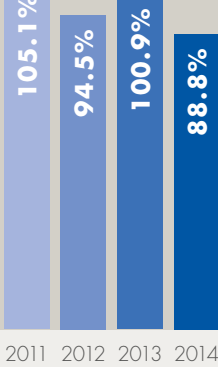
LOST TIME ACCIDENTS LTAFR (#LTAs/1M hrs)



↓ **-24%**
from 2010 baseline

We have seen a significant improvement of 50% compared to 2013 due to better communication and greater safety awareness reinforced by root cause analysis, gap analysis and an improved HSE behaviours framework.

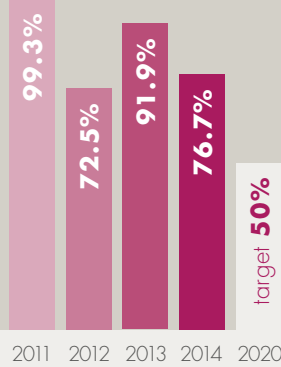
WATER USE m³/m³



↓ **-11.2%**
from 2010 baseline

We use minimal amounts of water in production, such as for cooling and cleaning. Water use is still less of a focus than energy, but we have been able to make some reductions in water use. We therefore recorded a reduction of 12.1% between 2013 and 2014.

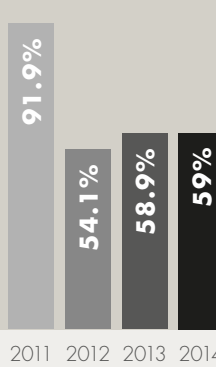
WATER DISCHARGE m³/m³



↓ **-23.3%**
from 2010 baseline

We discharge only small amounts of water but still have seen a reduction of 15.2% compared to 2013. A range of new water system initiatives should see an improved performance in the future.

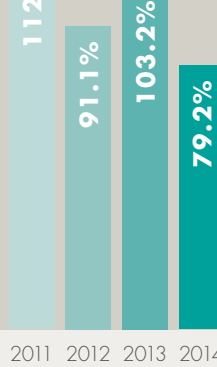
NO_x Kg/m³



↓ **-41%**
from 2010 baseline

Due to lower energy consumption and improved energy efficiency, we have seen a decrease of 41% compared to our 2010 baseline. NO_x emissions are linked to energy consumption so these emissions have stabilised in line with our energy use. As we continue to focus on energy efficiency and use the latest state-of-the-art technologies we hope to further improve this figure.

SO_x Kg/m³



↓ **-20.8%**
from 2010 baseline

SO_x emissions are mainly caused by Rock Mineral Wool technology. At several of our plants the quality of management of Rock Mineral Wool raw materials and associated technologies have been improved and this has led to a 24% decrease in emissions between 2013 and 2014.

SUSTAINABILITY GOVERNANCE

For over a decade we have focused on a number of initiatives relating to energy efficiency, high-level policy advocacy, our people and our environmental resources. In 2010, a steering committee for sustainability was established, which formalised our efforts into our sustainability strategy, consisting of three key objectives and nine long-term aims with programmes/mid-term targets aimed at delivering those.

PRIORITIES: ENERGY AND WASTE

We are working hard to achieve each long-term aim, but given that we are an energy intensive manufacturer our biggest areas of impact are energy and waste. Since 2010, our baseline year, we have reduced energy use by 15.3% and achieved a 48.8% reduction in waste to landfill. This is well on the way to achieving zero waste to landfill by 2020 and reducing energy 20% by 2020.

LOOKING AHEAD

As we continue the work to transform our manufacturing processes – reducing energy, waste, lost time accidents, improving resource use and people management – we will continue to consolidate our position as a world leader in energy efficient systems for buildings through strong lobbying and product innovation. The construction market, still in recovery from the macroeconomic crisis, will remain challenging but we are well positioned to make the most of market changes. We expanded capacity again this year, and have plans for expanding further in the future.

THREE OBJECTIVES

NINE LONG-TERM AIMS

TARGETS AND PROGRAMMES

BE RECOGNISED AS A RESPONSIBLE MANUFACTURER AND EMPLOYER	Zero carbon production	A 20% reduction target by 2020
	Zero negative impact on resource use	A mid-term target of substituting resources for those with a less negative impact on resources use as identified through Life Cycle Assessment, towards eco-design
	Zero waste to landfill	A target completion by 2020
	Zero waste water discharge (from production)	A mid-term 50% reduction target by 2020
	Zero harm	A 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
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 FOR CHAMPIONING ENERGY EFFICIENCY IN BUILDINGS	Leading advocate	To ensure a robust regulatory framework for delivering low energy new build, mandatory renovation of buildings and mandatory real performance of buildings by 2020 through capacity building, informing the business and advocacy
	Zero carbon building stock	20% reduction of CO ₂ from our building stock by 2020 through internal building programme



ABOUT THIS REPORT

This Sustainability Report relates to Knauf Insulation, part of the Knauf Group. This Report refers to data from 2014 and activities from 2014 and 2015. Our data management continue to be improving. For accuracy we may amend previous figures to new definitions. The content and quality of the information are guided by the Global Reporting Initiative’s (GRI) G3 sustainability reporting guidelines. The contents of the Report are complemented by information available online and from other local Knauf Insulation company websites. The data provided are as comprehensive as possible considering recent acquisitions and we intend to provide data on our entire operations in future reports. In 2014 the boundary of the reporting entity, Knauf Insulation, covered 24 manufacturing sites across Europe, CIS and North America.

YOUR VOICE!

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

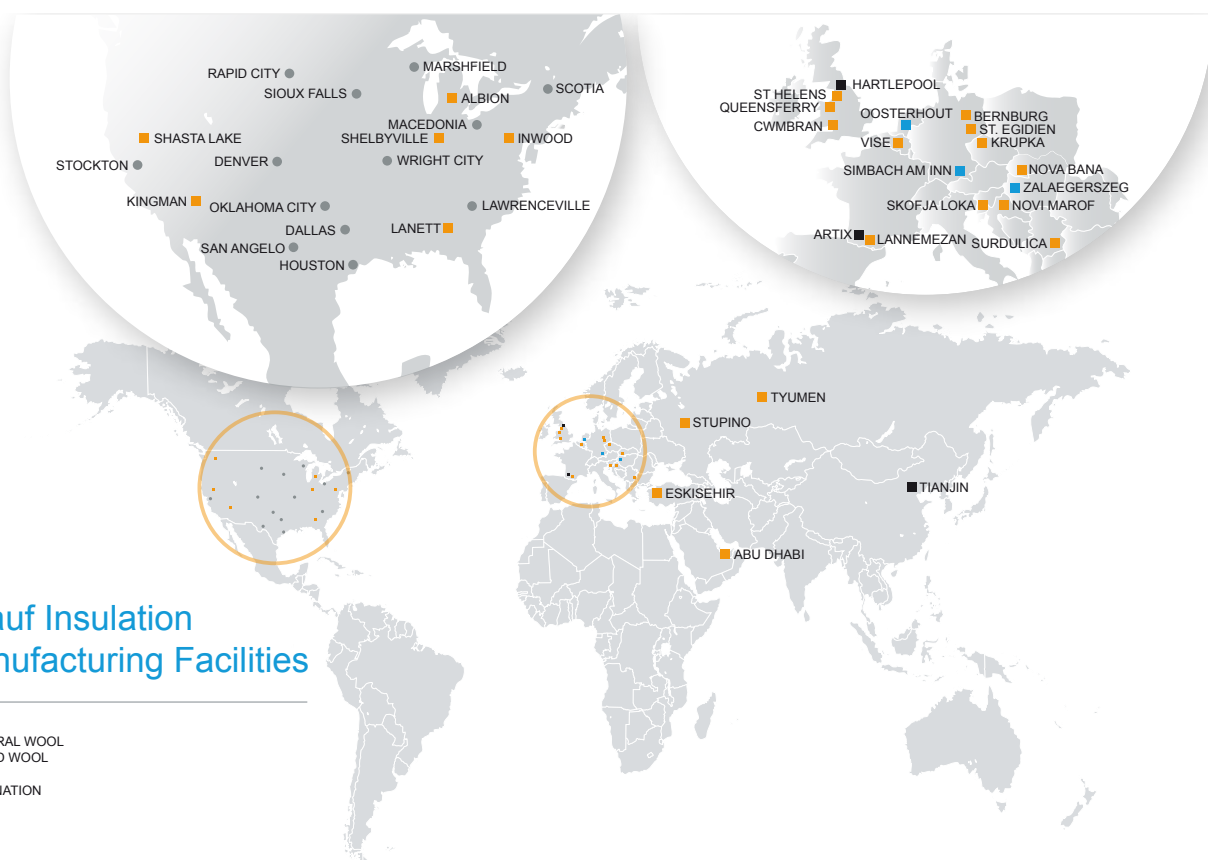


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Read more at <http://www.knaufinsulation.com/en/sustainability>



KNAUF INSULATION is one of the world's largest manufacturers of insulation products and solutions. With more than 30 years of experience in the industry, we represent one of the fastest growing and most respected names in insulation worldwide. Our business is energy efficiency. We're committed to meeting the increasing demand for energy efficiency and sustainability in new and existing homes, non-residential buildings and industrial applications by driving standards to improve initiatives around the world. To see more on our organisational profile, see the 'about us' section of our website www.knaufinsulation.com



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