



SUSTAINABILITY REPORT

 **2012**



## CEO Statement

Last year Europe exported over 500 billion euro of its wealth, simply to pay for energy imports; the US exported 421 billion dollars (347 billion euros). This wealth could have been spent fuelling our economies rather than being wasted heating and cooling energy inefficient buildings. This money could have been invested in employing people locally to renovate buildings rather than inflating already huge sovereign wealth funds abroad. At a time of economic crisis, when we need jobs and economic recovery, buildings are like an untapped natural resource. If there was ever a time to tap into this resource, to release its energy to power recovery, to help create a sustainable future, then that time is most certainly now.

As an insulation company, the most sustainable thing that we can do is make sure that more insulation goes into new buildings and more buildings get renovated; let's not forget that a typical Knauf Insulation glass mineral wool product saves more than 500 times the energy used in its manufacture. Therefore, we cannot sit back and hope for the best but rather we must ourselves take leadership and strive to show a way out of this crisis. And I am proud to see that we are playing a role. Whether it is in fighting for better legislation in Europe on energy efficiency or launching the Energy Response Corps in the US, we are trying to support sustainable growth. But going forward, we will have to do more, we will have to be more; the days of easy growth are behind us.

And to be a credible voice for change, we have a responsibility to also ensure that we are continuing to get our house in order. In this year's report, you will see how we are moving on from our ambitious long-term aims, to putting in place the necessary action plans to move them forward. You will see how we are developing new systems and how we are taking on the challenge of real thermal performance in buildings.

Like the wider economy, we will continue to be impacted by the ongoing economic difficulties but for us opportunities still abound. In the US alone, there are 64 million under-insulated homes, where heat and money is simply bleeding out of people's pockets. In Europe, the energy efficiency renovation of the building stock would deliver a net benefit of roughly 10 trillion euro. And in places like Canada, Australia and New Zealand where we continue to grow our presence the opportunities are the same. So going forward as a company and as a society it's no longer simply time to save energy, it's time to ensure that energy is saved.

**Tony Robson - CEO Knauf Insulation**

“ At a time of economic crisis, when we need jobs and economic recovery, buildings sit like an untapped natural resource. If there was ever a time to tap into this resource, to release its energy to power recovery, to help create a sustainable future, then that time is most certainly now. ”

## About this report

Welcome to the third edition of the Knauf Insulation Sustainability Report. This year's report gives an overview of our activities during the last 18 months whereas the data covers our 2011 activities. The Report is guided by the Global Reporting Initiative (GRI) G3 sustainability reporting guidelines. Additional information about the initiatives covered in this year's report is available on our website and from the local Knauf Insulation Company websites listed on our homepage.

Find out more about sustainability at  
[www.knaufinsulation.com/en/philosophy\\_environmental\\_management](http://www.knaufinsulation.com/en/philosophy_environmental_management)

## Contents

0	CEO Statement	12	From Products to Solutions
2	Who we are	20	Our Company
4	Buildings and Society	32	Next Steps

## Sustainability at Knauf Insulation

Over the last 18 months, we have been improving our approach to sustainable operations, engagement and data processes. Colleagues from across our operations have worked together in task groups to define ways to achieve our long-term aims, including how to fulfil our 2012 commitments. Each task group has identified performance indicators and starting from our 2010 baseline year, we have begun to define how we will reduce the impact or get closer to achieving our long-term aims.

Task Groups report to our Sustainability Steering Committee which consists of senior colleagues and Board members.

Sustainability has also become central to our revamped HR strategy which is now more people centric and long-term. Our long-term aim is to have the strongest Triple-E sustainable people strategy in our industry, starting with ensuring that all our people are 'Energised, Enabled and Engaged'. See more on pages 28-29.

Area (task group)	Long-Term Aims	Trend 2011	Page
Buildings (Buildings task group)	- Recognised as a leading advocate for a sustainable, low-energy built environment	+	6-11
	- A zero carbon building stock (owned and operated)	=	10-11, 22-23
Products and Systems (Products task group)	- Products best in class for sustainability	=	14-19
Company (Manufacturing task group and People task group)	- Zero carbon production	+	22-23
	- Zero negative impact on resource use	+	24-25
	- Zero waste (to landfill and waste water)	=	26-27
	- To have the strongest Triple-E sustainable people strategy in our industry	=	28-29
	- Zero harm (Lost Time Accident)	-	30

+ positive trend = steady trend - negative trend

## Our recent certifications, awards and endorsements



Fabio Staffolani, General Manager Knauf Insulation Italy, receiving the Legambiente Award in March 2010





# Who we are and where we are going

The Knauf Group is a family owned multi-national manufacturer of building materials and construction systems.

Knauf Insulation is the second largest division in the group, with over 5,000 employees and operations in 35 countries.

## NOW WE'RE TALKING

“The construction markets in Europe and North America are still struggling to find their feet but the insulation market continues to outperform the general construction trend. We are even more hopeful for 2013, when we predict accelerated growth for the insulation industry as a whole.”

**Davide Maiello**  
Head of Business Intelligence,  
Knauf Insulation

Whilst construction trends in regions like Russia remain positive, the construction markets in Europe and North America are still struggling to rebound given the continued macro-economic difficulties. But within this, the insulation sector continues to outperform the construction market trends. Given that if the world is going to reduce its dependence on energy, it will need a lot more insulation, at Knauf Insulation we continue to invest in new production and other facilities. Some of the highlights from the last 18 months include:

- **Visé, Belgium – expanding capacity:** a €66m investment to expand Europe's largest glass mineral wool manufacturing plant, increasing capacity of the site by 25%.
- **Novi Marof, Croatia – new capabilities:** the installation of a new wired mat plant in 2011 and the start-up of a new pipe insulation machine in early 2012, will improve capabilities.
- **Eskisehir, Turkey and Tyumen, Russia – new acquisitions coming up to standard:** reconstruction of these two newly acquired plants will increase their capacity by more than four times and offer the ability to produce Glass Mineral Wool with ECOSE Technology as standard.
- **Shelbyville, US – new and improved:** the rebuild of one of the two main furnaces and a new warehouse, offers better production and increased on-site storage.
- **Nova Bana, Slovakia – better packaging:** the new multi-pack automated packaging line introduced covers the entire product range.
- **Tianjin, China – more product, less impact:** doubling capacity at our Tianjin extruded polystyrene (XPS) plant with the installation of a new extruder that is designed to use carbon dioxide as a blowing agent gives us more product at a lower impact.
- **Skofja Loka, Slovenia – basking in the sun:** the installation of a major rooftop solar panel power plant helps fulfil our renewable energy commitments.
- **Krupka, Czech Republic – going for zero:** in line with our zero waste to landfill objective, Krupka installed a new end of line scrap recycling system, allowing us to recycle all of the plant's dry scrap directly into our product.
- **Stupino, Russia – sorting it out:** the installation of an advanced recycled glass cullet sorter is making it possible to further increase recycled content in our Glass Mineral Wool.
- **St Helens, UK – getting better at being better:** our product and process development site in St Helens benefited from a needed upgrade.

Knauf Insulation Glass Mineral Wool in production



## Doing what we do, better

The next decade will see a move towards nearly zero-energy buildings (NZEB) as the norm for new build and the thermal renovation of the built environment; the objective being to reduce dependence on fossil fuels, reduce carbon dioxide emissions and save people money. Moving from the current building standards to these new low-energy levels is already a demanding task for the entire building chain but it turns out the challenge is even harder. Why? Simply because the evidence suggests that whilst the market can deliver low-energy buildings on paper it is struggling to deliver them in reality.

At Knauf Insulation we are committed to understanding why buildings do not always perform as expected and to developing systems and solutions that can help put this right. In this year's report we explain more about our work in the area of building science (pages 14-15) and explain where we see our role as a company developing so that we can help the market deliver real performance, every time.

## Knauf Insulation at a glance:

- 1.2 billion euro in turnover in 2011
- Over 5,000 employees in more than 35 countries
- 30 manufacturing sites worldwide
- 2.4% employee turnover rate

## NOW WE'RE TALKING

“Knauf Insulation's expansion project in Visé, Belgium, proves that the insulation sector is booming at a European level. At a time when European energy needs are spiralling upwards and the solutions to save this same energy is more than ever essential, the insulation sector holds a bright future – as does our site in Visé.”

**Mark Leverton**  
Managing Director Western Europe

Operational Site Locations in 2011



Knauf Insulation's award winning Glass Mineral Wool with ECOSE® Technology has up to 82% recycled content



# Buildings and Society

The next few years are set to be challenging for society. Whilst in an economic crisis, society must tackle climate change decisively, limit the depletion of natural resources and break its addiction to fossil fuels. It's a lot to take on, but we believe that there's a powerful solution that can help.

## Stimulating the economy through buildings

The energy wasted in buildings is one of the largest and most unnecessary costs to society. In Europe alone the estimated net cost of this **waste is €500bn** each year.

As cash-strapped governments face the current global economic pressures, the imperative to deliver a 'sustainable built environment' has never been stronger.

**€500bn is the net cost of energy wasted every year through buildings in Europe**

Where else can governments reduce carbon emissions, create jobs and recover up to **€5 in tax revenue for every euro** they invest? So why are buildings not a high priority for governments?

Around the world we are pushing regulators to create policies and financial frameworks that will deliver near 'zero-energy' new buildings and improve the performance of existing ones. As it stands, energy loss in buildings remains far too low a priority for governments, but we are doing our best to change that.

**€1 → €5**  
Governments could recover up to **€5 in tax revenue for every €1 invested**

## What are we aiming for?

- To be recognised as a leading advocate for a sustainable, low-energy built environment
- A zero-carbon building stock (owned and/or operated)



The concrete skeleton of an apartment building stands abandoned mid-construction at the Pueblo de Luz suburb development in Almeria, Spain. Before the real estate bubble burst, the capital and province of Almeria were booming. Buildings have the potential to reduce carbon emissions, create jobs, and stimulate the economy.

## In this section

6. A sustainable built environment: an engine for economic recovery
8. The 'right direction' for campaigning for energy efficiency in buildings
10. Getting our own house in order

# Buildings and Society

## > Buildings: an engine for economic recovery

Construction has traditionally been an important engine of growth. And whilst new-build was one of the causes of the current economic troubles, thermal renovation of existing buildings is the answer to restarting the economy.

### Sustainable buildings create enduring jobs

Sustainable building programmes create long-term, local and high-quality jobs for the future. These will be crucial as we rebuild our economies. From architects to installers, carpenters to site managers, not only does creating a low-energy and sustainable built environment rely on professionals from across the construction value-chain, it is also creating new opportunities in energy services and financial sectors, and this requires additional skills and expertise. Add to this the boost that these jobs give to government funds through tax returns and increased consumer spending and the built environment quickly becomes a stimulus package that governments cannot ignore.

The good news is that the concept of zero-energy construction has been endorsed worldwide and whilst there is still a significant effort required to ensure that zero-energy buildings actually achieve

zero-energy in reality, and that standards for sustainable buildings are enforced, the net zero-carbon buildings market should hit a massive \$1.3 trillion by 2035.

The worldwide revenue from the 'zero-carbon' building market will hit \$690bn by 2020 and will nearly double by 2035. That's a compound annual growth rate of 43%, with much of that growth occurring in the European Union according to figures by Pike Research.  
[www.pikeresearch.com](http://www.pikeresearch.com)

But the delivery of zero-energy new buildings is not enough. More than half of the existing building stock around the world will still be standing in 2050. Governments must map out policies to stimulate and support 'deep renovation'. Without this, the opportunity to create new jobs, drive sustainable growth and build momentum for change will be lost.

**300,000 direct jobs**  
are generated annually through Germany's renovation programme

### €100 billion a year to drive growth

A 2012 study by the European Insulation Manufacturers Association (Eurima) and international financial expert Peter Sweatman concluded that the thermal renovation of buildings could deliver €100bn a year in investment. These investments would pay for themselves through energy savings, whilst delivering jobs and driving recovery.

The study, entitled 'Financing Mechanisms for Europe's Building Renovation' concluded that 90% of this finance could come from the private sector, and that governments should use smart financing mechanisms, such as the KfW scheme in Germany or the Green Deal in the UK.

For more information and a copy of the report, visit:  
[www.eurima.org](http://www.eurima.org)



Šparna hiža', one of the first NZEB multi dwelling housing developments in Koprivnica, Croatia used Knauf Insulation Rock Mineral Wool contact facades.

### Mobilising private finance for energy efficiency

In February 2012, the European Alliance to Save Energy (EU-ASE), organised a high-level debate entitled, 'How to mobilize private sector finance for energy efficiency' with the support of the Danish Presidency of the EU. The debate brought together some of the world's largest investors and private enterprises with senior policy makers and industry stakeholders to discuss energy efficiency policy from an investment perspective. The message was clear: energy efficiency is the next financial gold mine.  
[www.euase.eu](http://www.euase.eu)

### Triggering a 'cash machine' for governments

Buildings could be a 'cash machine' for governments. Yet governments worldwide are still failing to seize the opportunities. So we have been working with independent financial experts and industry partners to convince governments to 'push the green button'.

We have brought together leading financiers to show how regulatory and delivery frameworks for energy efficiency in buildings can work. The frameworks need to sustain long-term demand and unlock significant private sector financing for energy efficiency investments.

In line with our commitment to be a driving force for change, in March 2012 we joined the UK's new Green Deal Finance Company (GDFC) in collaboration with other leading enterprises. This new, not-for-profit organisation intends to minimise the operating and administration costs of the UK Government's new Green Deal energy efficiency policy. A representative of Knauf Insulation in the UK sits on the GDFC steering group.

### Renovating deep to get the best results

For us it's clear: deep renovation is the most cost-effective way for governments to meet energy and carbon related goals, provide jobs and stimulate the economy. Deep renovation means improving the energy performance of the built environment by at least 80% using insulation and other energy-saving technologies. Deep renovation of existing buildings could **save 32%** of the total primary energy used in Europe, equivalent to the total energy production of European coal and nuclear power suppliers, or a saving of four billion barrels of oil per year. Renovating deep also offers substantially better employment opportunities compared to other retrofit approaches.

Recent research has demonstrated that a deep renovation programme in Poland could create around 250,000 additional jobs per year by 2020, compared to the estimated 40,000 forecasted in the current business-as-usual scenario.

Over the past 12 months we have boosted our efforts to promote 'deep renovation'. Through our involvement in the Renovate Europe Campaign, we are calling on all European governments to draw up ambitious deep renovation plans. These could raise the annual energy efficiency renovation rate of European buildings to 3%, which could result in an **80% reduction of energy** used in the building stock by 2050. Renovate Europe Day takes place in October each year to urge senior politicians, academics and industry to join the cause, ensuring that energy efficiency in buildings is a cornerstone of future policies for energy policy and sustainable growth.  
[www.euroace.org](http://www.euroace.org)

**80% reduction**  
in energy used in buildings could be achieved by 2050 by raising the rate of renovation to 3%



According to recent research on the German KfW scheme from the Jülich Research Centre, for every €1 that went into the promotion of energy efficient construction and refurbishment in 2010, public authorities collected €4-5 in revenue.  
[www.kfw.de](http://www.kfw.de)  
[www.renovate-europe.eu](http://www.renovate-europe.eu)

**RENOVATE EUROPE**



# Buildings and Society

## > The 'right direction': campaigning for energy efficiency in buildings

In 2011 and 2012 we expanded our advocacy team and created brand new partnerships to campaign even more forcefully for a low-energy, sustainable built environment.

### Green Building Councils: world-beating action

Knauf Insulation has become a Regional Partner of the World Green Building Council's (GBC) new **Europe Network**. We joined along with peers such as Skanska and United Technologies Corporation. The Network comprises over 90 GBCs and 3,500 companies across the building and construction industry.

As part of our commitment to the new Network, we provided public affairs training to dozens of local GBCs in 2012 and we gave presentations on Life Cycle Assessment at the national annual GBC conferences of Slovenia, Slovakia, Serbia and Czech Republic.

We also expanded our central European efforts by becoming a founding member of the Ukrainian GBC (UaGBC). The UaGBC will drive the implementation of international green building standards and will promote sustainability more generally in the construction industry in Ukraine.

Meanwhile, Knauf Insulation Australia joined the Australian GBC, where we aim to support work to deliver projects and programmes in pursuit of a sustainable built environment for Australia.  
[www.worldgbc.org](http://www.worldgbc.org)

#### NOW WE'RE TALKING

“As a company we are familiar with contributing to the debate around sustainable buildings so joining the Ukrainian Green Building Council was a natural step forward for us.”

**Andriy Pavlyk**  
Director of Knauf Insulation Ukraine

### Europe says YES to renovation roadmaps

We have been working with our partners to help convince European Union decision makers to support strong provisions for buildings in the EU's new Energy Efficiency Directive (EED). After months of intense negotiations, in June 2012 EU Member States agreed to draw up national roadmaps to steer investment into the renovation of the national building stock. Each Member State must produce a first version of the strategy by 30 April 2014.

#### NOW WE'RE TALKING

“Knauf Insulation was the only company operating in the Czech Republic that approached me regarding Energy Efficiency Directive as an opportunity rather than a threat. It was encouraging to cooperate with them.”

**Pavel Poc**  
Member of the European Parliament for the Czech Republic



Andjelina Kuzmanovic, Head of Marketing South Balkans, speaking about sustainability with Oliver Dulic, Minister of Environment, Mining and Spatial Planning, at Serbia's first Green Building Council conference and exhibition, Belgrade.

### Giving buildings a chance in Czech Republic

Our colleagues in the Czech Republic faced an uphill struggle this year, following the veto by the Czech President of the law to transpose the Energy Performance of Buildings Directive (EPBD). By working closely with our industry and civil society colleagues from A Chance For Buildings we succeeded in getting our voice heard in the debate and were pleased when the Czech Parliament overturned the veto, leading to the Czech Republic becoming one of the first European countries to transpose this important legislation.

### Hungary: helping to put energy efficiency on the political map

In 2011 Knauf Insulation joined leading energy efficient solution providers in Hungary to support the new Hungarian Institute of Energy Efficiency (MEHI). MEHI has quickly become the leading business voice for energy efficiency and is making strides in putting energy efficiency on Hungary's political radar.

### Renovating historic housing in Chicago

In the US we demonstrated to Chicago's Historic Bungalow Association that energy efficiency renovations using sustainable insulation solutions can go hand-in-hand with preserving the cultural heritage of the distinctive Bungalow Belt. The partnership strengthens our links with the City of Chicago and Knauf Insulation is now one of the preferred suppliers for the Association's renovation initiative.



Christoph Frhr. v. Speßhardt, Public Affairs Manager Germany, outside the German Parliament with the message 'nuclear power could disappear altogether with greater energy efficiency'.

### Germany: more money for energy efficiency

In 2011, our colleagues in Germany had another busy and successful year! With DENEFF – the voice of their energy efficiency services industry – we worked hard with peers as well as German politicians and legislators to secure funding for a range of renovation initiatives. In particular, funding for the highly acclaimed KfW building renovation programme has increased to **€1.5bn a year** until 2014. This funding is expected to trigger **€13.5bn** in private investments in buildings. We are also working to promote a new programme for deep renovation and are hopeful that another €900m will be pumped into the renovation market in Germany in 2013.



# Buildings and Society

## > Getting our own house in order

We are serious about changing the built environment, not just through strong advocacy work, but also working to improve our own buildings.

### Abundant audits

Our entire building stock is currently undergoing the first phase of an energy audit. This work will help us to identify our best and worst performing offices and plants.

The second phase of the audits is planned for 2013. This will include a 'tipcheck' for our plants – a seal of quality and an insulation performance standard. Our newly certified Knauf Insulation Process Solutions tipcheck-engineer will assess the thermal and acoustic performance of our production facilities, identify improvement areas and give recommendations for energy savings.



The EiF TIPCHECK Programme trains qualified engineers to perform energy audits. Certified TIPCHECK engineers provide an independent report on industrial insulation performance. [www.eiif.org](http://www.eiif.org)

### From Green Office to 'Sustainable Workplace'

As part of our commitment to the concept of Green Office, we started the pilot of our 'Sustainable Workplace Initiative' this year alongside the local Green Office projects that have already been started. The initiative will help establish 'minimum standards' for aspects like office supplies and IT but also goes beyond the traditional 'green' concepts, by also focusing on the people aspect. We expect the Initiative to have been initiated in all offices by the end of 2012.

### New performance criteria for new buildings

In line with our 2011 commitments, we have developed sustainability criteria for new office buildings. The criteria will apply to all newly rented office buildings, any purchases of existing buildings and all new constructions. Of course energy efficiency is of primary importance in them. As you would expect, we will strive to showcase Knauf Insulation solutions in all new buildings.

### Our Ferndorf make over, Austria

In 2011, our Heraklith headquarters was retrofitted for the first time in its 50 year lifespan. The entire 750m<sup>2</sup> of the 1960's office building in Ferndorf was refitted with new windows and of course Knauf Insulation ceiling and wall systems.

The energy consumption of the building has almost halved from 73kWh/m<sup>2</sup> to 42 kWh/m<sup>2</sup>.

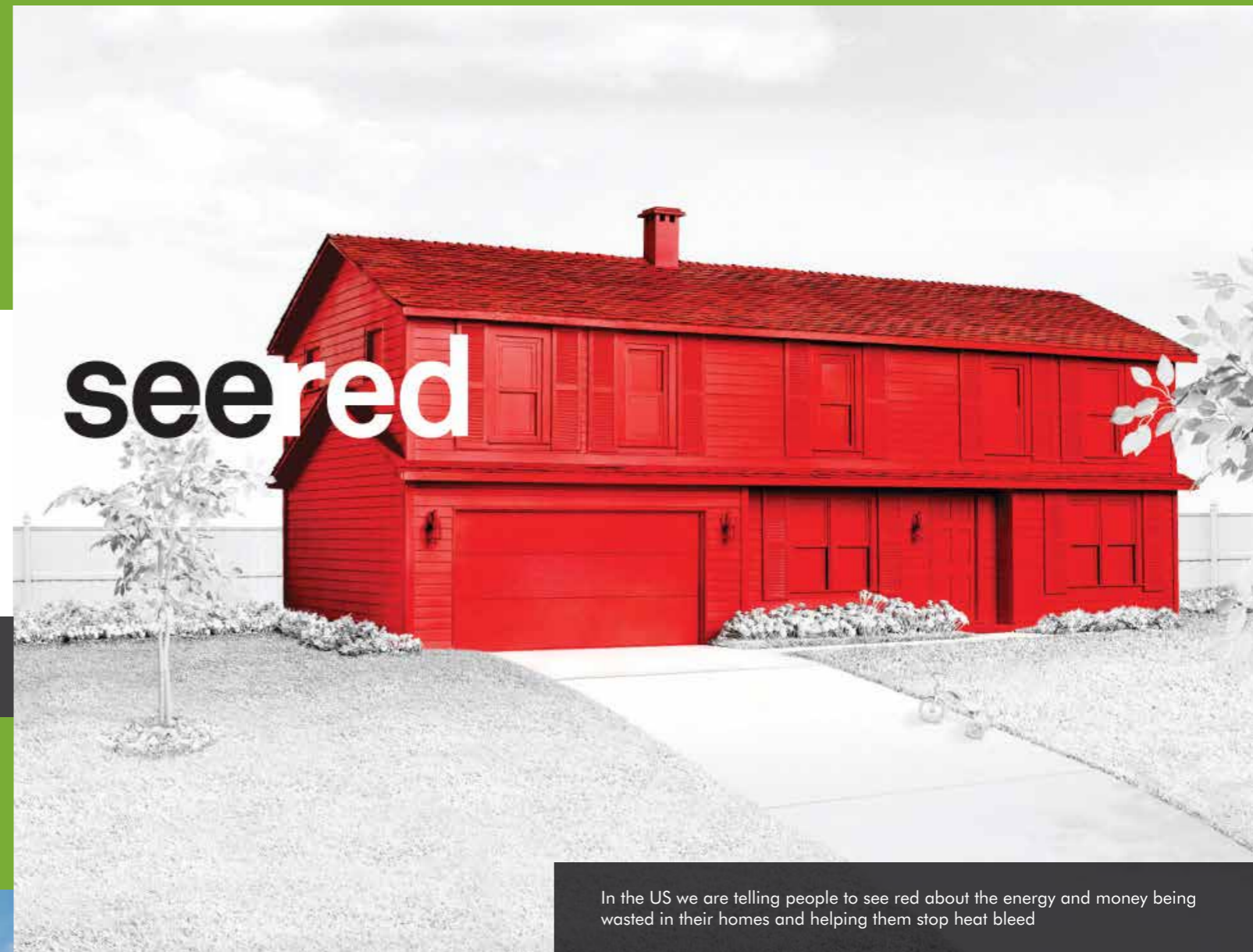


Following the retrofit in 2011 the energy consumption of our Ferndorf office has almost halved

### NOW WE'RE TALKING

“ The building is now aglow in its new splendor: the plastered walls are painted in our Heraklith corporate colours and the ceilings are covered with brightly painted Wood Wool boards; these not only improve the interior design of the building but also help with acoustic performance. ”

**Gerhard Huber**  
Facility Manager and Head of Maintenance



In the US we are telling people to see red about the energy and money being wasted in their homes and helping them stop heat bleed



### Energy Response Corps: stopping 'Heat Bleed'

Knauf Insulation North America recently launched the Energy Response Corps, a new initiative working with homeowners to help stop 'Heat Bleed'; the 'invisible thief' that drains homes of energy and money.

Using our online tool 'PLUG', users can evaluate the performance of their home. Then, using thermal imaging, our energy auditors pinpoint Heat Bleed in homes, helping homeowners to manage their energy consumption and eliminate heat loss.

We are proud that we have already rolled out this initiative to our employees in the US. Employees have 'stopped losing' and 'started winning' by improving household energy performance by using insulation and other solutions. [www.energyresponsecorps.com](http://www.energyresponsecorps.com)

### NOW WE'RE TALKING

“ The renovation market has historically been strong in most of Europe, but it is very small in the United States. Existing homes in our country therefore tend to be incredibly inefficient. Our goal is to create a true renovation market by launching a business model that benefits Knauf Insulation, our contractor partners and homeowners. We are starting by working to help our employees eliminate Heat Bleed in their homes. ”

**Joey Viselli**  
Vice President, Marketing, Knauf Insulation North America



# From Products to Solutions: for real

Today, we know that buildings often do not deliver the thermal performance intended and that environmental claims are often unconvincing, unconfirmed or both. We need to be sure that performance can be delivered, not just in design but in reality.

## A focus on knowledge

At Knauf Insulation we are working with leading experts to understand why buildings do not always deliver real thermal performance and how we can help to make sure they do.

With the expanded knowledge comes new sustainability expectations; we are therefore developing and bringing to the market new integrated product systems that can make a real difference in the delivery of low-energy buildings. These are designed to ensure the best in-situ performance and to deliver against wider sustainability criteria. See pages 18-19 for examples of our systems.

## A focus on our own impact

In parallel to better understanding how to impact real thermal performance in buildings we are also improving our understanding of the environmental impacts of our products and systems. By conducting Life Cycle Assessments (LCAs) - 50% of the products we manufacture will be covered by the end of 2012 - we will be able to share credible information in the markets we serve. In turn, by training our teams in LCA thinking - 100 of our colleagues are now trained - we can help ensure that this also gets communicated to the market.

**50% of the products we manufacture will be covered by an LCA by the end of 2012**

## What are we aiming for?

- Products recognised as best in class for sustainability



Knauf Insulation's new Homeseal system being installed in a timber frame construction, France

In this section

- 14.** A focus on knowledge
- 16.** Getting our framework right
- 18.** Creating solutions that really deliver



# From Products to Solutions

> A focus on knowledge

We are working hard to harness our knowledge and expertise in order to provide new sustainable solutions that deliver the 'thermal envelope' for real.

## Revolutionising our understanding of buildings

One of the greatest obstacles to delivering a low-energy and sustainable built environment is ensuring that buildings perform as expected in reality and not simply in design. There is a performance gap to close and it is the responsibility of all of us who make up the building chain to close this gap.

At Knauf Insulation we do not shy away from our responsibilities. As a manufacturer of thermal insulation products and systems, we must develop an understanding of what is going wrong at the building level and play our role by developing systems and solutions that make it easier to deliver buildings that deliver real performance every time.

To do this, we have assembled leading building scientists, architects and policy makers to work with us on an ambitious new building science programme. The programme aims to understand how to deliver buildings that actually perform as intended, to devise new insulation solutions and to define the regulatory tools needed to deliver such solutions in practice. We have also been working with experts on in-situ and laboratory testing and we will be using the results to inform the development of better building standards. We are already working with the International Energy Agency's (IEA), 'Annex 58' group and the European Standardisation Committee (CEN) Working Group 13, on common standards for in-situ testing.

## Testing for real performance beyond buildings

It is a lesser known fact that Knauf Insulation is also an established name in the domestic appliances sector. For example, we are one of the largest suppliers of tailored insulation solutions to improve energy performance and air quality in ovens.

In 2011, to drive innovation in this field, we acquired new state-of-the-art equipment for our testing laboratory. We can now pinpoint any performance problems in a domestic appliance, such as energy inefficiency, and develop our products further to meet the specific needs of our customers.

## NOW WE'RE TALKING

“The large gap between design and real performance of buildings is unacceptable. There is a need to develop our understanding of what is going wrong in order to tailor solutions to resolve the performance issues. Taking it further, we want to make sure everyone in our sector is aware of the vital need to get buildings right. We want momentum from all corners of the industry to make this happen.”

**Tony Robson**  
CEO Knauf Insulation

Morad Atif, Chairman of the Executive Committee of the International Energy Agency's Energy Conservation in Buildings and Community Systems team, at Knauf Insulation's first Reality Check, March 2012.



## Leading a Reality Check for buildings

Our building science programme kicked off to an exciting start in March 2012 with the first-ever Knauf Insulation Reality Check Symposium. Held over two days in France, a panel of world-leading experts sought to define a way forward to ensure that the thermal envelope of buildings performs as designed. We will take forward the recommendations from the Symposium over the next 12 months, starting with a series of White Papers: technical guidance for specifiers to better understand real performance in buildings. We published the first of the series in September 2012.

In April 2012 we completed a co-heating test (a whole-house heat loss test) in collaboration with the Belgian Building Research Institute (BBRI) to investigate the real performance of a thermal renovation. The test, which monitored energy use, indoor and outdoor temperatures and wind and solar radiation, showed a significant reduction in total heat loss of the dwelling after installing Knauf Insulation Supafil blowing wool. The results are now being used to inform the work of the European Standardisation Committee relating to new standards for in-situ thermal performance of construction products, building elements and structures.

## Driving robust standards

Our drive towards delivering real performance does not stop with thermal performance; we are taking this mindset across our work, including in the area of fire safety.

Working with fire safety and construction experts as well as industry colleagues within Fire Safe Europe, we are developing a better understanding of how changes to thermal regulations for buildings are impacting fire safety as well as how countries across Europe are responding. The results are not encouraging.

## NOW WE'RE TALKING

“There has to be more testing. This is needed at all levels from research to production so that we understand the gap much better, find ways of closing it and, just as importantly, ensure that it is kept closed. This is a joint responsibility of government and industry, working together for the benefit of all.”

**Malcom Bell**  
Emeritus Professor of Surveying and Sustainable Housing, School of Construction and Engineering, Leeds Metropolitan University, cited at the Knauf Insulation Reality Check, March 2012



Our co-heating test in April 2012 used Knauf Insulation's Supafil blowing wool

On one hand, recent research suggests that some of the current European testing protocols are not properly reflecting real fire performance and need to be amended to ensure that they do. On the other, fire safety regulations across Europe vary dramatically, meaning that tourists, students and migrant workers may not be guaranteed an acceptable minimum standard of fire protection across the EU. At Knauf Insulation we believe this is not acceptable and with our colleagues at Fire Safe Europe we are working to put this right. [www.firesafeeurope.eu](http://www.firesafeeurope.eu)



# From Products to Solutions

## > Getting our framework right

We want our insulation solutions to be best in class for sustainability, and from an environmental perspective, we believe the most robust way to measure our impacts is through Life Cycle Assessment (LCA).

### Three things to know about Life Cycle Assessment (LCA)

1 – LCA is a standardised method that compiles and evaluates inputs, outputs and potential environmental impacts of a product, system or building throughout its life cycle.

2 – Depending on the scope, LCA analyses everything from raw material extraction, through production, and up until the product leaves the factory gates (cradle-to-gate), or it can go beyond this and include the use phase until final recycling or disposal (cradle-to-grave).

3 - Unlike most green labels, LCA does not try to rate or judge environmental performance, but it characterises environmental impact through a series of standardised indicators.



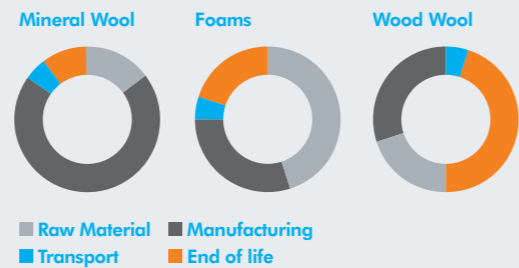
### What we have learnt from our LCAs

We are currently on track to have LCAs complete for 50% of the products we manufacture by the end of 2012. This has helped us to target environmental improvements at the right stages of the life cycle of different products. We are committed to having all LCAs available by the end of 2013. Soon, the LCA programme will be extended across our range of Original Equipment Manufacturing (OEM) and fire safety solutions. In addition, this year for the first time we have been working on LCAs for systems as well as products and this is helping to inform our thinking on the development of new solutions through eco-design (see pages 18-19).

Some of our key findings have been:

- @ECOSE Technology binder has a positive effect on several indicators such as energy, Global Warming Potential (GWP).
- In our foam materials our biggest environmental impact is actually at the raw material phase.
- In wood wool, substituting the cement or magnesite (binder) would have a big impact on key indicators such resources depletion and GWP.

These, along with other important findings, help the 'eco-design' of our products through manufacturing improvements. They also support the accurate communication of their impacts. Through LCA and energy performance calculation, we can quantify the huge benefit of the energy saved in the 'use' phase compared to the environmental impact from any other stage in the life cycle as part of manufacturing the product.



Different technologies (Mineral Wool, Foams and Wood Wool) have very different environmental impacts. For Global Warming Potential, the biggest impact for Mineral Wool is in manufacturing, whereas for Foam the biggest impact comes from raw material.

### NOW WE'RE TALKING

“Knauf Insulation has developed its reputation in the Czech Republic through a product portfolio which predetermines a healthier indoor environment that Skanska wants to produce. Thanks to the technology used in manufacturing the products our company can reduce the carbon footprint of the buildings that we build; an ideal synergy in which customers of both companies can benefit.”

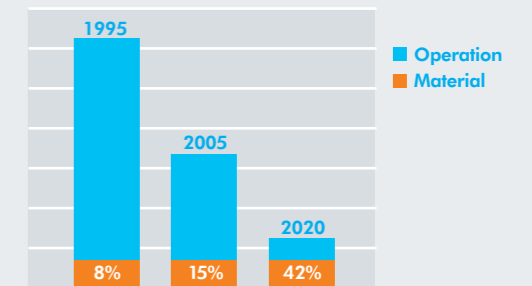
**Petr Lhoták**  
Senior Technologist and Sustainability Consultant, Skanska

### From sustainability of products and systems to sustainability of buildings

In buildings, construction products are just one element of a more complex system (i.e. combination of external walls, roof, windows) and with LCA, the performance of the whole system impacts the environmental performance of a building.

Until now, legislation has rightly concentrated on the use stage of buildings (i.e. heating and cooling) as this has the largest impact. Through the implementation of legislation like the EU's Energy Performance of Buildings Directive (EPBD II) the environmental impact of the use phase will reduce significantly and by 2020 new buildings will be Near Zero-Energy Buildings (NZEB). But over time, as the environmental impact of the building use phase is reduced, the relative environmental impact of the materials used to construct the building will become much more important. Clearly, it is now time to work on the impact of the construction materials and this is where our LCA work is coming into play.

The relative environmental impact of construction materials vs, use over the building life cycle.



In 1995, construction materials represented only 8% of the total energy of the building over its life cycle. Yet in 2020, when new buildings will be near zero-energy, the construction materials will represent 42% of the total energy (over a 50 year life cycle of a typical office building in Germany, source: Dr Peter Moesle).

### EPDs: the way to communicate LCA

Environmental Product Declarations (EPDs) is the standardised communication format for the environmental impact of construction products (Type III). EPDs are based on LCA results. Each EPD is specific to a product in a particular application, allowing for the first time proper comparison between the environmental impact of products. EPDs are available upon request, or published on dedicated websites such as [www.inies.fr](http://www.inies.fr) in France and [www.bau-umwelt.de](http://www.bau-umwelt.de) in Germany.

**100 colleagues**  
and counting have been trained as part of our company-wide LCA and sustainability programme

### Going further to measure the credentials of Wood Wool

In 2011, our colleagues in Hungary, Germany and the Netherlands worked with PE International on LCAs for Heraklith Wood Wool homogenous boards and multi-layer products with the aim to reveal impacts and improvement opportunities in production.

This LCA further strengthened the credentials of Wood Wool: for homogenous panels the sequestered embodied carbon in the wood virtually offsets the carbon footprint of the binding agent used, whilst still considering the methane released at the end-of-life.

As customers begin to request more complex combinations of materials and thicknesses of insulation, we are developing a new tool to show the results of all LCA indicators for any given specifications.





# From Products to Solutions

> Creating solutions that really deliver

The more we understand what is going wrong in the built environment, the more we are able to tailor solutions that are right. This year, colleagues from across our operations have been working on a range of new solutions that will deliver real results for our customers, for the environment and for society.

## A systems approach

It is increasingly clear that many building performance problems are caused by poor design and installation, rather than by the materials used. Nonetheless there are things that we can do as a material supplier to help the situation. Moving to delivering systems and solutions is just one of these.

And, the main benefit is that by combining various products and materials we can meet several criteria at once, such as weight, acoustics and fire safety. This enables our customers to find 'best in class' solutions that meet even the most demanding requirement.

## Air tightness systems

Delivering low-energy buildings that deliver real performance is not just about insulation; it also requires that other key issues, such as air tightness, are adequately addressed. As good insulation and good air tightness need to go hand in hand, Knauf Insulation has introduced new air tightness systems to work with our range of insulation products.

### Luftdicht-Dämmsystem air tight insulation system

In Germany, our Luftdicht-Dämmsystem (LDS) air tight insulation system for timber frame construction guarantees air tightness for 50 years. Core to its performance is the development of adhesive tapes with an extremely durable gluing system and layers that provide a suitable substrate for these tapes according to a new German draft standard (DIN 4108-11). The system is certified and we now aim to roll it out in other countries.



### Knauf Insulation Homeseal system; airtight system for timber frame construction

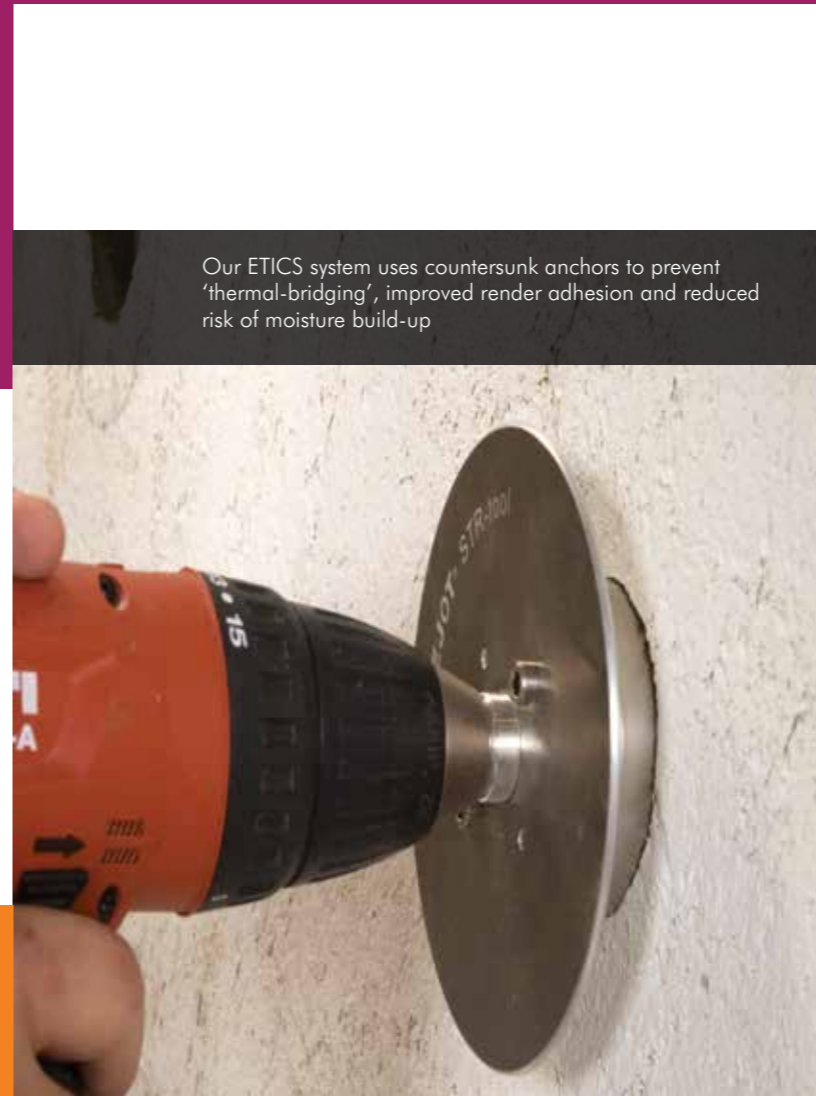
The Knauf Insulation Homeseal system helps deliver an energy efficient thermal envelope for a building. It combines the right insulation product with the ultimate air sealant, Quickseal, and it is easy to install. An entire standard house of 120 m<sup>2</sup> can be insulated and sealed in two days by one person. This system has been tested using a 'blower door' test, achieving Passive House levels, a rigorous, voluntary, ultra-low energy standard. This system is known as Knauf Insulation ECOSEAL in the US and Homeseal in Europe.

## NOW WE'RE TALKING

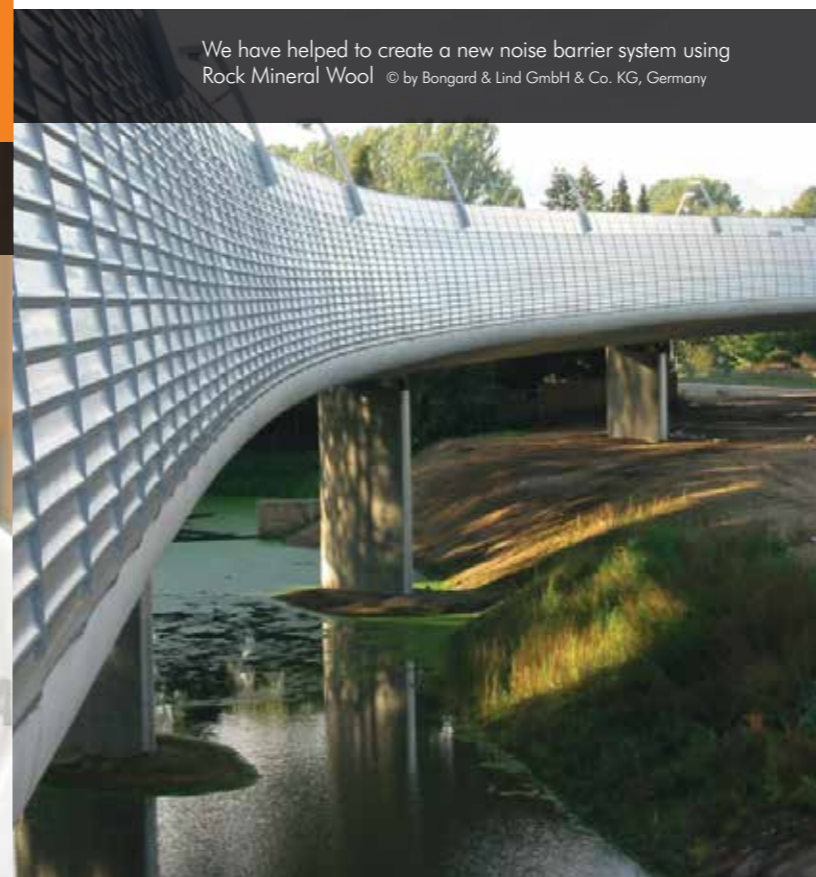
“Due to regulatory requirements on energy efficiency, air tightness and vapour control, buildings are getting increasingly more complex. It is our challenge to develop solutions that deliver real performance against these requirements, while at the same time making them simple and straightforward for the customers.”

**Bert Declerk**  
Head of Products and Markets, Knauf Insulation

Installation of Glass Mineral Wool with ECOSE Technology as part of the Knauf Insulation Homeseal system



Our ETICS system uses countersunk anchors to prevent 'thermal-bridging', improved render adhesion and reduced risk of moisture build-up



We have helped to create a new noise barrier system using Rock Mineral Wool © by Bongard & Lind GmbH & Co. KG, Germany



## Lightweight roof system

We have developed Kventi, a lightweight roof system made of an XPS foam board with an integrated metal support for roofing tiles. The boards are strong, highly moisture resistant and easy to cut and shape with 100% closed cells. This makes them suitable for insulating above the rafters in the renovation and construction of pitched roofs. It is a complete system comprising all the accessories needed to properly fix the boards and tiles, as well as allow ventilation. Combined with a layer of Glass Mineral Wool installed between the rafters the system can achieve R-values up to 10m<sup>2</sup>K/W. It also has a good acoustic, thermal and fire performance. The system, which has already been successfully used in Italy, will soon be installed in timber constructions in Northern and Eastern Europe.

## External wall insulation system

In external wall insulation (EWI) components work together as a system that performs in reality, not just design. This system uses countersunk anchors to prevent 'thermal-bridging', improved render adhesion and reduced risk of moisture build-up. Coated boards have a mineral coating that dramatically improves render adhesion and reduces the amount of render needed in the first place. This means less time is needed to apply the board.

## Fire door system

In 2010, Knauf Insulation began work to develop a fire door system combining thermal and acoustic performance alongside fire protection. We now supply two fire door systems (i) single core, assuring fire resistance EI30, and (ii) double core, assuring fire resistance EI30 and sound absorption of 32dB. Both are undergoing official trials.

## Systems that go beyond buildings

In 2011 we worked on a whole new range of solutions, covering more than just energy efficient systems for buildings.

### An absorbing noise project

Noise pollution can be a civic nuisance in built up areas. We have been working with some of the largest manufacturers of industrial noise barriers on insulation solutions for use on busy roads, railways and industrial areas. We have created a new system using Rock Mineral Wool and we will shortly include Wood Wool and other materials in the system. It is all in aid of a more peaceful environment.

### Insulation in horticulture

We have a revolutionary new horticultural solution currently being launched. Instead of capturing air to act as a thermal barrier, an insulation layer captures water that is then slowly released back into the top soil above. This naturally hydrates it when needed, so it requires much less water than before to water the same area of soil. This could significantly reduce water use which, in water stressed regions, could be vital.

This new product is particularly advantageous for water-intensive golf courses and could help in other areas of horticulture too.



# Our Company: a year of consolidation

2011 was a year of consolidation at Knauf Insulation. With two sustainability reports under our belt, we have spent the past 18 months improving our approach to sustainable operations, engagement and data processes.

## New results and new people across the company

Our Sustainability Steering Committee and Task Groups have been working towards our long-term aims and we have made good progress. We have seen significant improvements in energy and resource use, helped largely by clearer data, and we continue to increase the use of recycled glass in our Glass Mineral Wool. We have done this whilst continuing to grow both as a manufacturer and as a responsible employer.

In 2011, we welcomed 128 new employees. This year we have become more people-centric and are kicking off efforts to integrate our revamped sustainable people strategy into every aspect of Knauf Insulation. This sustainable people strategy will work to Energise, Enable and Engage our people. See more about our sustainable people strategy throughout the document and specifically on pages 28-29 of the Report.

## Better data, better decisions

Our performance indicators are now based on Knauf Insulation standards. These standards have already enabled us to benchmark our progress across geographical locations, and better understand and define the right paths to take to fulfil our commitments to reach our long-term aims.

**To move towards zero carbon production, we've now set a target to reduce our CO<sub>2</sub> intensity by 20% by 2020**



## What are we aiming for?

- Zero carbon production
- Zero negative impact on resource use
- Zero waste to landfill and zero waste water discharge
- The strongest 'Triple-E' sustainable people strategy in our industry
- Zero harm

In this section

- 22.** Energy and CO<sub>2</sub>
- 24.** Resource use
- 26.** Waste and water emissions
- 28.** Our people
- 30.** Safety and community

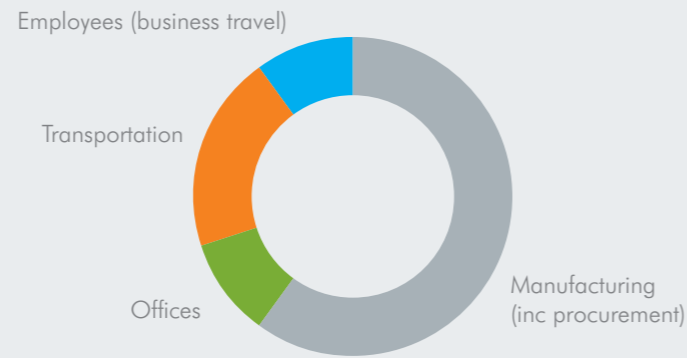


# Energy and CO<sub>2</sub>

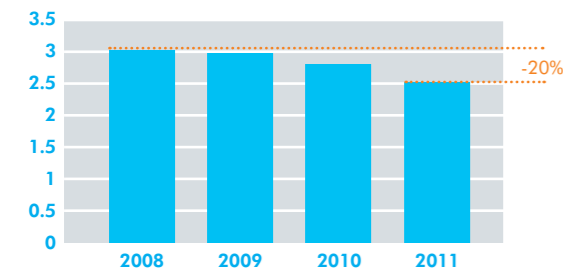
## > Zero-carbon production

### Progress summary

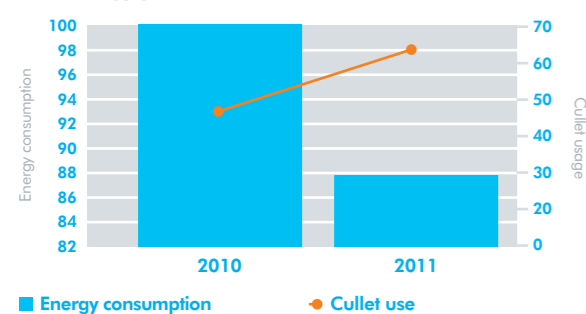
- Total energy use decreased by 6.2% from 2010 to 2011
- Energy per tonne of output down by 13.9% from 2010 to 2011 for Glass and Rock Mineral Wool
- CO<sub>2</sub> per tonne of output down by 2.8% from 2010 to 2011 for Glass and Rock Mineral Wool
- Knauf Insulation buildings: began Phase I of the energy efficiency self-audit
- Employee travel and product transport data projects underway, results due in 2013
- 'Green Office' initiative piloted (see p10)



We've reduced our energy use (MWh) per tonne of product of Mineral Wool by 20% since 2008



External cullet usage up, energy down; the more cullet we use in our Glass Mineral Wool the better the energy performance



To move towards zero carbon production, we've now set a target to reduce our CO<sub>2</sub> intensity by 20% by 2020

Our biggest energy impact by far comes from manufacturing. But we are also reducing the energy impact of office operations, product transportation and employee travel.

### Product manufacture

From 2010 to 2011 we reduced overall group energy use (GMW, RMW, WW, Foams) by 6.2% and group direct CO<sub>2</sub> emissions by 2.8%. This reduction is due to ongoing process efficiencies, increased production volumes and an increase in the use of recycled content in Mineral Wool production. We know that it will become harder to find ways to reduce energy use, but through our Energy Action Plans and dedicated Energy Managers we will find ways to become more energy efficient in manufacturing our various products.

For our Mineral Wool (GMW and RMW) the reduction in energy use from 2010 to 2011 has been even more significant, with energy use per tonne of product down by 13.9% and by 20% respectively since 2008. Amongst other reasons, this reduction is thanks to the use of cullet, the recycled glass material in our Mineral Wool, that helps reduce the amount of energy needed and we continue to increase the amount of cullet in Glass Mineral Wool production. See page 24 for more on recycled content.

### NOW WE'RE TALKING

“ In 2011 we installed a 'free cooler' at our Hartlepool plant which utilises the low outside air temperature to cool water required to maintain process temperatures. This new system of cooling, instead of the previous energy intensive refrigeration chillers, reduced the energy consumption for chilling by over 60%. ”

**Nigel Sinclair**  
Project Manager Plastic Foams

### Offices

Whilst our offices are not the biggest user of energy, we are working to reduce energy use in offices where we can. For example, since 2010 we have significantly reduced the energy use in our Oosterhout office and our office in Prague came first in the local initiative to reduce energy in the office block. For more on what we're doing to achieve a zero-carbon building stock see page 10.

### Product transportation

This year we advanced our project to measure the carbon emissions from product distribution in Europe and CIS. The data collection and analysis of logistics are underway. The next stage is to develop carbon reduction plans to 2020, followed by an action plan. But actions have already started. In Queensferry, UK, we invested in new fork lift trucks that have shown a fuel saving of 50% in the first six months of use.

**We're committed to reducing the average CO<sub>2</sub> of our car fleet by 5% a year for the next four years**

### Employee travel

We piloted the mapping of our carbon footprint for employee travel in the UK. We are now verifying the figures and the Sustainability Steering Committee is considering how best to extend the UK approach across the company to help monitor and reduce the travel impact of all employees. To reduce the need for unnecessary travel we are also testing a new IT communication system across the company to provide common instant messaging, voice and video conferencing and desktop sharing to all our employees wherever their geographic location.

### NOW WE'RE TALKING

“ Zero-carbon is a challenge, but everyday we find new and innovative ways to be more efficient and one day we will be able to manufacture our energy saving product without any carbon at all. ”

**Allan Morgans**  
Energy Manager, Knauf Insulation



New solar panels at our plant in Skofia Loka, Slovenia: an example of renewables being installed at production sites



Becoming more and more efficient; melting glass for our Mineral Wool takes us almost a fifth less energy than it did four years ago

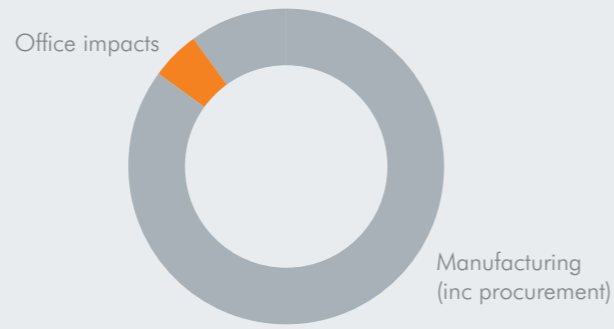


# Resource Use

## > Zero negative impact on resource use

### Progress summary

- Improving resource efficiency through increased recycled content, including up to 82% recycled glass in our Glass Mineral Wool
- Water use per tonne of Glass and Rock Mineral Wool remained stable
- Plant impacts as measured by LCA: work is in progress, results due in 2013
- North American plants averaged 51% post-consumer recycled glass
- Wood Wool opportunities tested at Oosterhout
- Cullet plans under review in all Glass Mineral Wool plants



## To move towards zero negative impact on resource use, we're pushing recycled content and getting a better grip on our impacts

### Manufacturing

Regarding materials, we have used recycled products in our manufacturing for many years. Through Life Cycle Assessment (LCA), we are able to better understand how our use of materials affects various KPIs (Key Performance Indicators). Because of this, LCA is starting to influence which materials we use in our manufacturing processes. Furthermore, 'indicators' such as Global Warming Potential (GWP) and Abiotic Depletion Potential (ADP), were not previously factors in deciding what went into the manufacturing process. Through LCA these impacts are now visible and we can work towards finding substitutes for higher impact materials. See more about how LCAs improve our products on p16.

The biggest use of water comes from manufacturing, particularly in Mineral Wool production. Mineral Wool requires water as part of cooling during production, in the binder preparation for 'fiberisation' and for cleaning. We're working to make these processes more efficient with water use and whilst water use per tonne of product in Mineral Wool remained steady from 2010 to 2011, we have reduced water use significantly (39.5%) since 2008.

We have been moving ahead this year with our supply chain management programme. The programme is based on a staged approach, starting in 2012. In the first stage, the qualification and certification phase, we will map our main suppliers to find out how they manage quality, safety, environment, quality, risk and what issues are important in their operations. Using supplier questionnaires we have started to pilot the programme with some of our largest and most significant suppliers. Stage two will extend the scope and coverage of the exercise and the final stage is monitoring and feedback.

### Soaring recycling levels

We continue to drive up the use of recycled glass (known as cullet) in the production of Glass Mineral Wool. We achieved an average of 71% in Vise, Belgium, whilst at our St Helens and Cwmbran sites in the UK (which includes internal recycling streams), recycled content reached 82%.

In the US, our Glass Mineral Wool is validated twice-yearly by UL Environment on recycled content levels and in February 2012 we were validated to 61.9% post-consumer recycled glass content by weight, an improvement of 6.2% on the previous six months.

In other sites we're looking for the right quality cullet as poor quality cullet contains contaminants, such as ceramics, which can damage production equipment. In some countries, however, poor recycling infrastructure limits quality suppliers of recycled content.

At our foam plants we continue to recycle production off-cuts from the XPS and EPS manufacturing process. Wood is, of course, a readily renewable resource.

### NOW WE'RE TALKING

“ These levels of recycling weren't considered possible just a few years ago. While we're proud of achieving such a high level, this is also a celebration of people who care about recycling. We appreciate the recycling effort of each and every individual who takes time to think about the future and how to positively affect it. ”

**Scott Miller**, Director of Sustainability, Knauf Insulation North America



We have achieved up to 82% recycled glass in many European GMW plants.

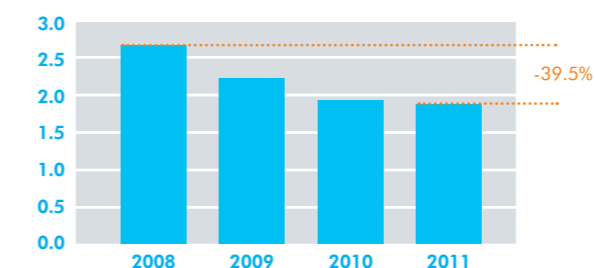


Over the past 12 months we have improved process efficiencies to significantly reduce the amount of cooling required in production

### Office impacts

We are working to improve the impact of our offices, such as office supplies, water use and have already rolled out many local Green Office initiatives such as the ECOWORKS in the UK and 'DUKIO' in the Netherlands. In 2012, we piloted the Sustainable Workplace Initiative, see p10 for more details.

We've reduced water use m<sup>3</sup>/tonne of Mineral Wool product by 39.5% since 2008



### Taking responsibility in Skofia Loka

In 2011, in Skofia Loka, Slovenia, we put 4,839 tonnes of waste Rock Mineral Wool back into the production process thanks to a take back initiative instigated with our customers.

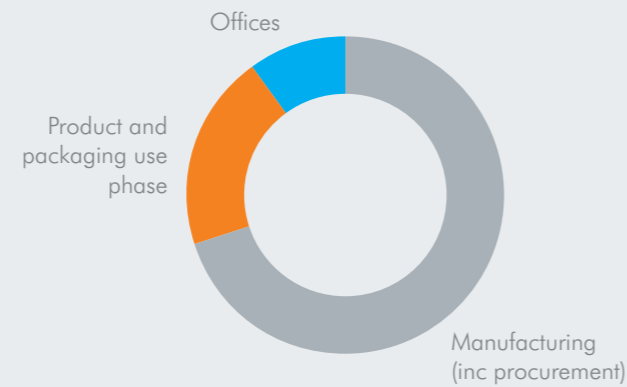


# Waste and Water Emissions

> Zero waste to landfill and zero waste water emissions

## Progress summary

- 27% decrease of non-hazardous waste to landfill per tonne of product
- 9.8% decrease of hazardous waste per tonne of product
- Water discharge for Mineral Wool decreased by 6.05% per tonne of product
- Product end-of-life waste: internal programme and data system under development, results and reporting expected 2015
- Packaging waste: group-level programme under development, local practices in place, results and reporting expected 2015

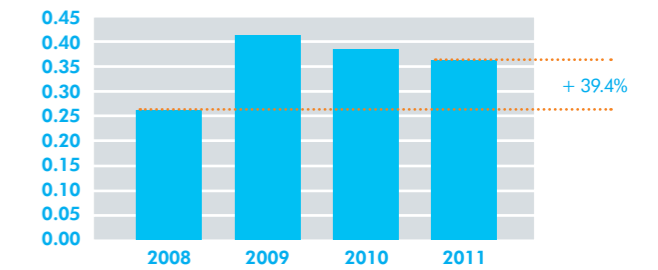


To achieve zero waste water discharge, we've committed to a 50% reduction of waste water by 2020, both for offices and manufacturing

## Offices

Whilst small in comparison to manufacturing, we are also looking at possibilities to reduce waste and water emissions from our offices. Initiatives all over Knauf Insulation are helping reduce, re-use and recycle waste from offices. Water efficiency is included in our new criteria for new buildings and is part of the Green Office initiative. See p10 for more.

For Mineral Wool, water discharge m<sup>3</sup>/tonne product has decreased over the past three years, although increased since 2008



## Product packaging and end-of-life

We want to reduce the impact of the waste that results from using our products and after the life of the product; packaging waste and end-of-life. Regarding packaging, Knauf Insulation's technical team has recently completed a major upgrade of our stitching and packaging technologies, changes in pallet size and improvements in packaging techniques. This allowed a 30% increase in technical insulation product per pallet. This helps lower the freight cost and the environmental footprint per unit of material shipped to market. This year, after careful consideration we did however decide not to pursue pallet take-back across operations as this was no longer priority.

With every installation comes inevitable left-over product. With every house demolition, waste insulation arises. We believe in finding the most sustainable local solution in dealing with this waste and we plan to look closely for real solutions for waste during installation and demolition.

## NOW WE'RE TALKING

“ In Krupka we participated in a collective waste management programme run by Ekokom, a waste system that partners with Municipalities, manufacturers and local communities. It led to a CO<sub>2</sub> emission saving of 156 tonnes, the equivalent of 3,720 GJ energy savings. ”

**Pavel Michalek,**  
Health, Safety and Environment and Systems Manager,  
Knauf Insulation Krupka

## We will achieve zero waste to landfill by 2020

### Manufacturing

From 2010 to 2011 we reduced our non hazardous waste by 29.7% and we reduced our hazardous waste by 9.8%. Since 2008 the results are even more impressive, with reductions of 40% for non hazardous and 63% for hazardous waste. These significant reductions have been the result of better production quality control, such as edge-trimming processes, as well as finding more channels that could use waste as raw material, like in the production of ceiling tiles. Furthermore, as our reporting improved, we standardised definitions across plants so that data are now comparable. This definition process will also enable us to better track and manage internal by-products in order to promote their recycling and re-use.

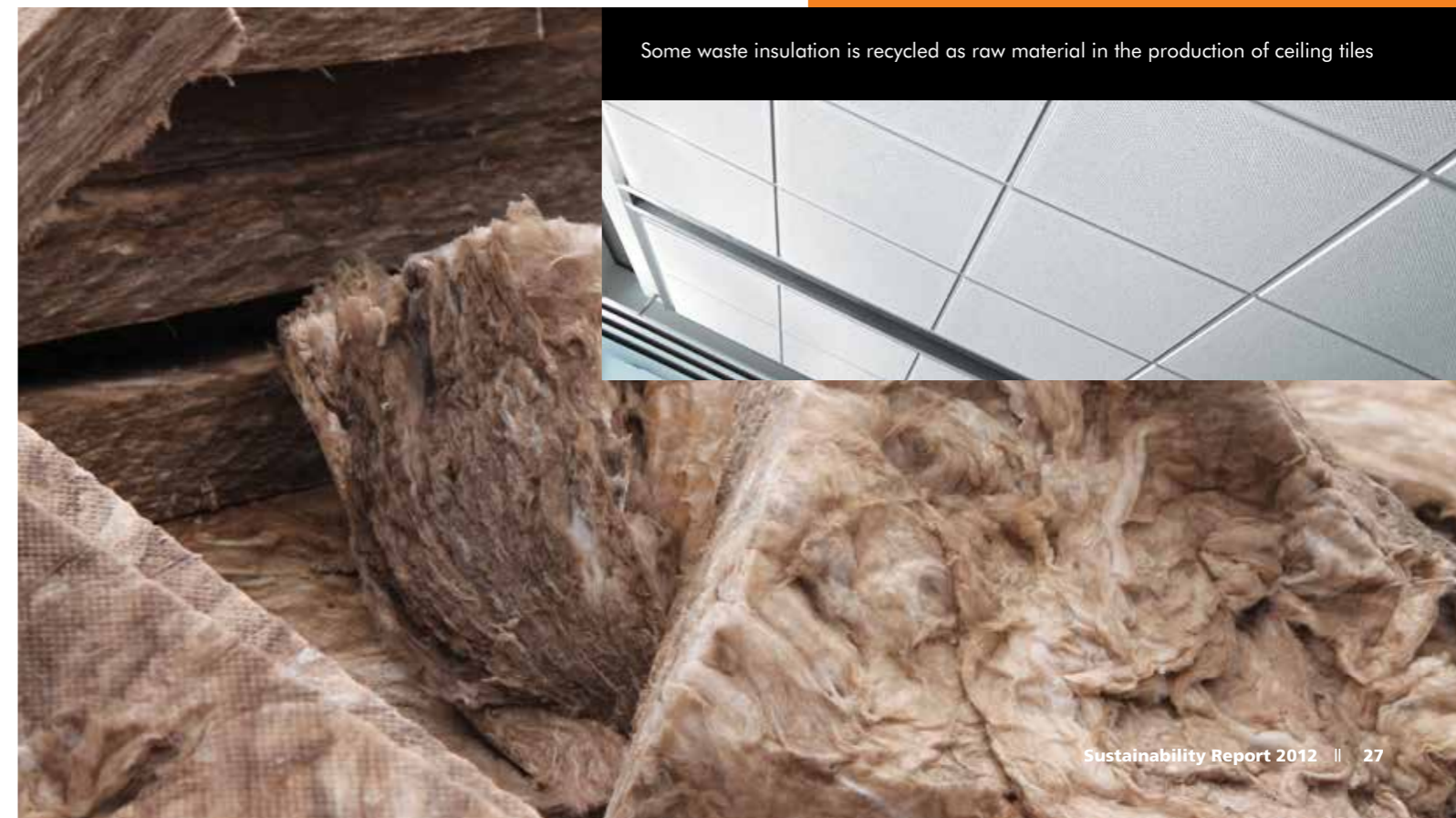
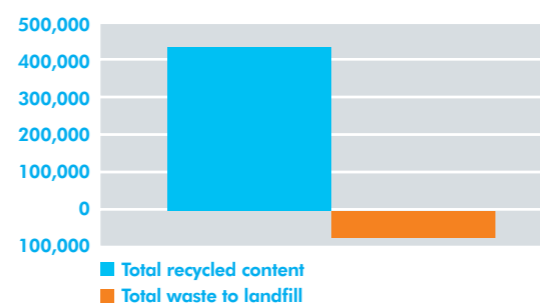
Regarding waste water, the greater proportion of our waste water emissions comes from manufacturing. We have a number of examples of initiatives to reduce water emissions, such as our closed loop water circuit in Lannemezan, that have contributed to the 6.05% reduction in waste water emissions per tonne of product across our operations since 2010. A water management review is planned for 2013.

For information on our emissions to air, please see p30.

We've reduced hazardous waste to landfill by 63% and non hazardous waste to landfill by 40% since 2008 in Mineral Wool production



We take more waste from society through recycled content in our manufacturing than we send to landfill



Some waste insulation is recycled as raw material in the production of ceiling tiles



# Our People

> To have the strongest 'Triple-E' sustainable people strategy in our industry

**ENERGISE**

- Foundation
  - Safe
  - Fit
- Strength
  - Balance
  - Resilient
- Dynamic
  - Informed
  - Inspired
- Inclusion
  - Respect
  - Belonging

**ENABLE**

- Develop
  - Skills
  - Impactful behaviours
  - Learning agility
- Stretch
  - Role and mandate
  - Challenge
- Support
  - Trust
  - Collaborative mindset
  - Efficient ways of working

**ENGAGE**

- Driven by values
  - Commitment
  - Partnership
  - Entrepreneurship
  - Menschlichkeit
- Getting perspective
  - Business future vision
  - Individual potential
- Equitable differences
  - Pay for competencies
  - Reward performance
  - Incentive initiative



Nadya Zhexembayeva, author of 'Embedded Sustainability', speaking at our Global HR meeting in 2012

Our new 'Triple-E' sustainable people strategy aims to energise, enable and engage our people. In 2012 it aimed to strengthen alignment between our HR teams and the business. Better qualitative performance indicators are planned and quantitative indicators, such as training hours and retention rate, will continue to help measure our progress towards achieving our long-term aim: to have the strongest Triple-E sustainable people strategy in our industry.

## Energise: foundation, strength, dynamic, inclusion

We're working to ensure that the experience of employees is founded on physical and emotional safety and wellbeing. To promote health and fitness at work we have new health initiatives as part of a sustainable workplace programme. 'Safety' in this context also means empowering employees to talk openly with others, so revealing other ways of working for wider benefits. For more on safety, see p30.

We are also working on developing the **strengths** of employees.

A sensible work-life balance will help productivity and loyalty. From strength derives resilience in the face of change.

To be **dynamic**, we believe our employees should be informed and inspired by their leaders so we will work to ensure leaders in Knauf Insulation support and motivate their teams.

For **inclusion** we have a hugely diverse workforce, Germany and Belgium have the highest mix of nationalities with 14 and 10 different nationalities respectively.

The sense of belonging is imperative and initiatives such as our cross-cultural learning workshops reinforce understanding between the project teams. We also have the Long-term Assignment Policy, which harmonises expatriate conditions and helps the transition of employees from abroad. We're also working to ensure employees are respected equally, regardless of age, race or sex. We recorded a higher proportion of female employees at our operations in Ukraine, Spain and Romania. Our gender ratio saw no significant change since 2010.

## More health initiatives

Healthy employees are core to sustainable operations. We are kicking off a number of initiatives to promote a more healthy and sustainable working environment. Advice covers ergonomic work stations, office comfort levels, healthy eating, and 'afterwork' activities.

Knauf Insulation employees, like these runners in Slovenia, are involved in a number of community sporting events



## Enable: develop, stretch, support

Our sustainable people strategy aims to develop the skills and performance of our employees. To **develop** the skills of our people we have increased learning programmes this year, delivering 18.8 hours of training per employee, up from 16.8 hours in 2010. We're also working to introduce impactful behaviours to Knauf Insulation. This year the Global HR conference focused on sustainable leadership with a group of leading experts and senior executives from Knauf Insulation were invited to share their experiences and opinions on how to responsibly lead a sustainable company.

We want to enable people through learning programmes, but also through **stretching** them to achieve their potential, by working on how to improve the management of employee performance and building on the success of the E-Appraisal through clear roles and mandates as well as challenging employees to go further.

We're also working on how to better **support** our employees through trust and a collaborative mindset which will enable them to perform more efficiently.

## Nurturing the talent of our people

We have focus groups that will be used to assess the impact of changes in our business to better understand the competencies needed in future. We aim to articulate plans for our key people to help them to get clearer perspective of their potential.

## Responsible employee benefits: our company cars

We took substantive steps towards a greener car fleet with our new global guidelines. The aim is to reduce the CO<sub>2</sub> of our car fleet. Eligible employees are incentivised to opt for low emission cars. To do this, we are using a clear framework of choices that encourage colleagues to go for smaller engines, setting a maximum power level, and setting maximum permissible CO<sub>2</sub> emissions relevant to where we operate. The next step will be to support alternatives to cars by flexing the benefits wherever it makes sense. For example, one might in future go for a personal transport lump sum plan, or a smaller car and get additional benefits to maintain internal equivalent benefits to other local colleagues.

## Engage: driven by values, getting perspective and equitable differences

Our employees' seniority is now eight years on average and we believe that our people are engaged when they are strongly connected with the company's goals and values.

We're working to ensure our employees understand and share the business **vision** and also ensure that individual potential is realised through career management and succession planning.

We aim to further inspire engagement by placing the right values at the heart of our operations. Our four **values** are commitment, partnership, entrepreneurship and 'menschlichkeit' (the human aspect).

We strongly believe that **equitable differences** motivate employees to perform better and go the extra mile. As such, we will incentivise our employees and reward performance and competencies.

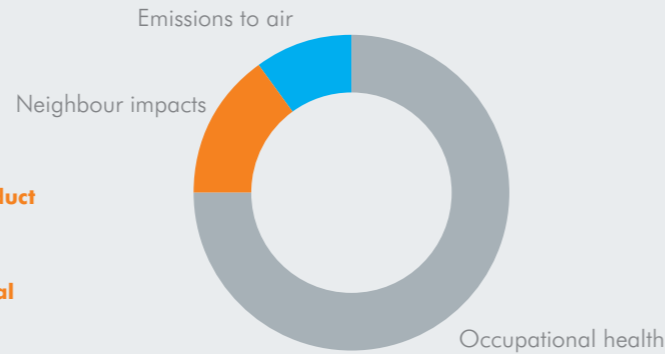


# Safety

## > Zero harm

### Progress summary

- LTA frequency rate increased to 19, up 11.9% since 2010
- LTA severity rate increased to 24, up 13% since 2010
- No fatalities in 2011
- SOx emissions for Mineral Wool increased by 5.7% per tonne of product
- NOx emissions for Mineral Wool decreased by 13.98% per tonne of product
- Four additional Knauf Insulation plants audited against International Management Standards



## To achieve zero harm, we're committed to reducing Lost Time Accidents (LTAs) by 50% by 2020

### A growing focus on safety

In common with other organisations which evolve and improve their safety management and reporting systems, there is a tendency for more incidents to be recorded over time. This is why frequency and severity of lost time accidents increased by 11.9% and 13% respectively in 2011 compared to 2010. There were no fatal incidents at Knauf Insulation in 2011.

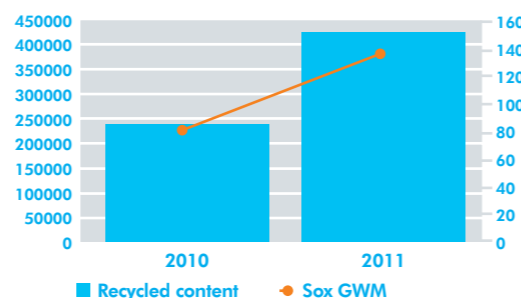
### Occupational health

In all our plants, with the exception of the US and China, we continue to operate under four of the most important International Management Standards for sustainability, including OHSAS 18001 Occupational Health and Safety Management. In 2011, more of our plants were audited by leading conformity assessor Bureau Veritas, which assures that we conform to this standard, as well as the other sustainability standards: ISO 9001 for quality management, ISO 14001 for environmental management and EN 16001 for energy management. This year we are running our HSE integrated management programme across our global manufacturing operations. This builds on success in 2010 when all plants in Europe, Russia and CIS were certified to four international management standards. For more on employee health, see page 28.

### Emissions to air

Our aim for zero harm extends to wider societal harm. Our emissions of SOx from our Mineral Wool production increased by 5.7% kg/tonne product in 2011. This is, however, a direct consequence of using more recycled content (known as cullet) in manufacturing. Using recycled content is not only a good use of a waste stream, but cullet requires less energy to produce our Glass Mineral Wool. This then means fewer NOx emissions; which have decreased by 13.98% as a result of lower gas consumption.

SOx are a currently an unavoidable consequence of higher recycled content in our GMW, which in turn reduces the amount of energy needed



# Community

## > Community spirit

### A better neighbour

Our Technical and Plant Managers are often at the head of community projects and sponsorships. And beyond reducing environmental impacts that we may have on local communities, we seek to become positively involved in the communities where we operate, beyond being a source of employment. Here are just some of the highlights that demonstrate this commitment to community engagement.

In the **US**, the pilot of the Energy Response Corps helps homeowners assess where they can make energy savings in all aspects of the home, from insulation to HVAC systems.

In **Serbia**, for Ecology Week, we held a series of events to inform the local community about environmental protection and energy saving.

In the **UK**, the Energy Efficiency Partnership for Buildings, of which Knauf Insulation is a founding member, facilitates closer working between business, government and community organisations on all aspects of energy efficiency in buildings to help homeowners achieve energy savings in their homes. Employees in the UK also cycled 360 miles raising £6,500 for two chosen charities – the construction industry's homelessness charity CRASH and Wirral Hospice St John's, both causes that are close to employees' hearts.

### Ophir, New Zealand: The town that came in from the cold



In 2012, our colleagues in New Zealand completed a 12 month project to insulate every single home and most commercial buildings in Ophir, one of New Zealand's coldest towns. The project installed Glass Mineral Wool with ECOSE Technology into the homes of their 50 residents of the small historic mining town transforming their energy inefficient houses into cozy and welcoming homes. To watch a video of the Ophir project visit: <http://www.knaufinsulation.co.nz/news-releases/ophir-the-town-that-came-in-from-the-cold.aspx>

### NOW WE'RE TALKING

“Knauf Insulation prides itself on community values and being a responsible corporate citizen. We believed this was a useful way to demonstrate our commitment to improving energy efficiency in New Zealand and help some very hardy South Islanders become more comfortable in their homes.”

**Stuart Dunbar**  
General Manager of Knauf Insulation AU/NZ

### Working with the town of Oosterhout to be more than an energy efficient neighbour



In Oosterhout, the Netherlands, Knauf Insulation signed a 'Green Deal' with the local city council that signifies the start of a cooperation between Knauf Insulation and profit/non-profit organisations to show that green and growth go together. For the next 3 years, we will support local projects of a social nature with knowledge, products and innovative solutions. These projects will contribute to the reduction of CO2 emissions in Oosterhout. Our office and plant in Oosterhout is not only a leading example in community engagement but is also one of our plants leading in sustainability with their sustainability programme, having seriously reduced their energy use in both operations and office as well as other environmental impacts.



# Next Steps

Our key commitments and progress are shown below. We have set out a number of long-term aims that are aspirational in nature and which are well beyond being achievable today. However, by adopting such targets we give a clear message to ourselves and to others about the direction we want to go. In addition, we have also clarified our commitments for 2013, as well as mid-term targets.

+ positive trend = steady trend - negative trend

	Buildings and Society		Products and Systems	Company					
Long-Term Aim	A leading advocate for a low-energy and sustainable built environment	A zero carbon building stock (owned and/or operated)	Have products recognised as best in class for sustainability	Zero Carbon	Zero Impact on Resource Use	Zero Waste to Landfill	Zero Waste Water Discharge	Zero Harm	To have the best Triple-E sustainable people strategy in our industry
Trend 2011	+	=	=	+	+	=	=	-	=
Mid-term Target	Support a transition to low-energy that works in practice and not only in design			20% reduction in CO <sub>2</sub> emissions by 2020		Achieve zero waste to landfill by 2020	50% reduction by 2020	50% reduction of LTAs by 2020	
2013 Commitments	Publicly advocate for the need to move to low-energy and sustainable buildings	Begin the energy efficiency renovation of the worst performing office buildings	Finalise LCAs for all products	5% reduction of CO <sub>2</sub> emissions across RMW plants	Further develop the new buildings criteria on new purchases and rentals	Establish re-use and recycling routes for old IT equipment	Implement new data collection process to analyse sources and quantities and inform action planning	Identify new 'leading' Key Performance Indicators for harm to support headline LTA indicator	Introduce Triple E Sustainable People Strategy Scorecard
	Publicly advocate for real performance in buildings	Begin the energy efficiency renovation of the worst performing manufacturing sites	Begin LCA for systems	Reduce impact of IT operations in offices (through the reduction of printers, promotion of the Lync communication system, etc)	Roll out the UK pallet repatriation initiative to 3 other plants	Increase focus on waste reporting and management		Introduce all tasks coming from best practice fire safety auditing	Engagement survey completed for Managers and Executives
	Further expand Public Affairs capacity	Ensure that all new purchased or rented buildings comply with new performance criteria for buildings	Introduce environmental and health impacts to the eco-design process	Survey and improve efficiency of motors and equipment in Foam and Wood Wool plants	Ensure all timber supplies for Wood Wool products are PEFC certified	Extend cullet increase plan with new targets for each GMW plant			Improve appraisals system
	Support key European Initiatives, such as the Green Building Councils, Renovate Europe Campaign.	Roll out Energy Response Corps offering to employees as a pilot programme in Europe	Improve LCA data collection by moving to automated data collection	Replace all blowing gases in foam insulation products with alternatives that have a GWP of less than 10	Implement Stage 2 of Supply Chain Management Programme	Extend RMW pilot project to reduce waste to landfill to less than 0.5%			Launch sustainable leadership programme
	Take leadership roles in national and regional advocacy platforms		Further communicate internally and externally on LCA thinking	Complete Energy Awareness training	Expand the UK GMW resource efficiency programme to other countries	Install new recycling equipment in Wood Wool plants to reduce profiling dust waste			Roll out Knauf Values Initiative
	Continue to develop building physics programme		Make Environmental Product Declarations (EPDs) available for 50% of products	Set and meet targets for truck fill-rate for each country					Complete first round of KI Global Talent Management
				Reduce CO <sub>2</sub> from our car fleet by 5% through new company car policy					Set up a People Governance Committee
									Launch new bonus scheme
Progress against 2011/2012 Commitments	<ul style="list-style-type: none"> <li>Expand our own public affairs capacity </li> <li>Work to improve the national capacity of our industry to be effective </li> <li>Continue to take a leadership role on low-energy buildings </li> <li>Expand our building physics programme with a focus on delivering real thermal performance in buildings </li> <li>Finalise our buildings audit including an audit of our factories </li> <li>Develop sustainability guidelines for the purchase and rental of new buildings </li> <li>Review the results of the building audit and develop a programme to improve the energy performance of our building stock </li> <li>Roll out a green office programme across the company </li> </ul>		<ul style="list-style-type: none"> <li>Continue the roll out of LCA analysis of our products, with the goal that 50% of our products will be covered by LCAs </li> <li>Formalise interaction between LCA outcomes and NPAD process </li> <li>Roll out full training programme of our marketing and technical staff on LCA thinking </li> <li>Begin customer training on LCA thinking </li> <li>Piloting a take-back initiative from construction sites </li> </ul>		<ul style="list-style-type: none"> <li>Roll out our HSE integrated management system globally </li> <li>Develop employee awareness training for energy usage </li> <li>Survey our production plants to identify potential for energy reduction through better thermal insulation </li> <li>Continue to save energy by installing more energy efficient equipment in plants and offices (e.g. lighting) </li> <li>Implement a company-wide energy monitoring system </li> <li>Methodology and target definition to map CO<sub>2</sub> footprint for finished goods distribution </li> <li>Cullet increase plan – PPD and plants </li> <li>Increase opportunities for recycling Wood Wool </li> <li>Group Air Monitoring (SO<sub>x</sub>, NO<sub>x</sub>, Phenol Formaldehyde) </li> <li>Group Workplace health measurements to identify non-conformities and improve working conditions </li> <li>Reduce waste to landfill in all Rock Mineral Wool plants, with a pilot waste management initiative to reduce waste to landfill to less than 0.5% </li> </ul>				

Progress key: ● = Complete ● = 75% complete ○ = 50% complete ◐ = 25% complete ○ = 0% complete





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