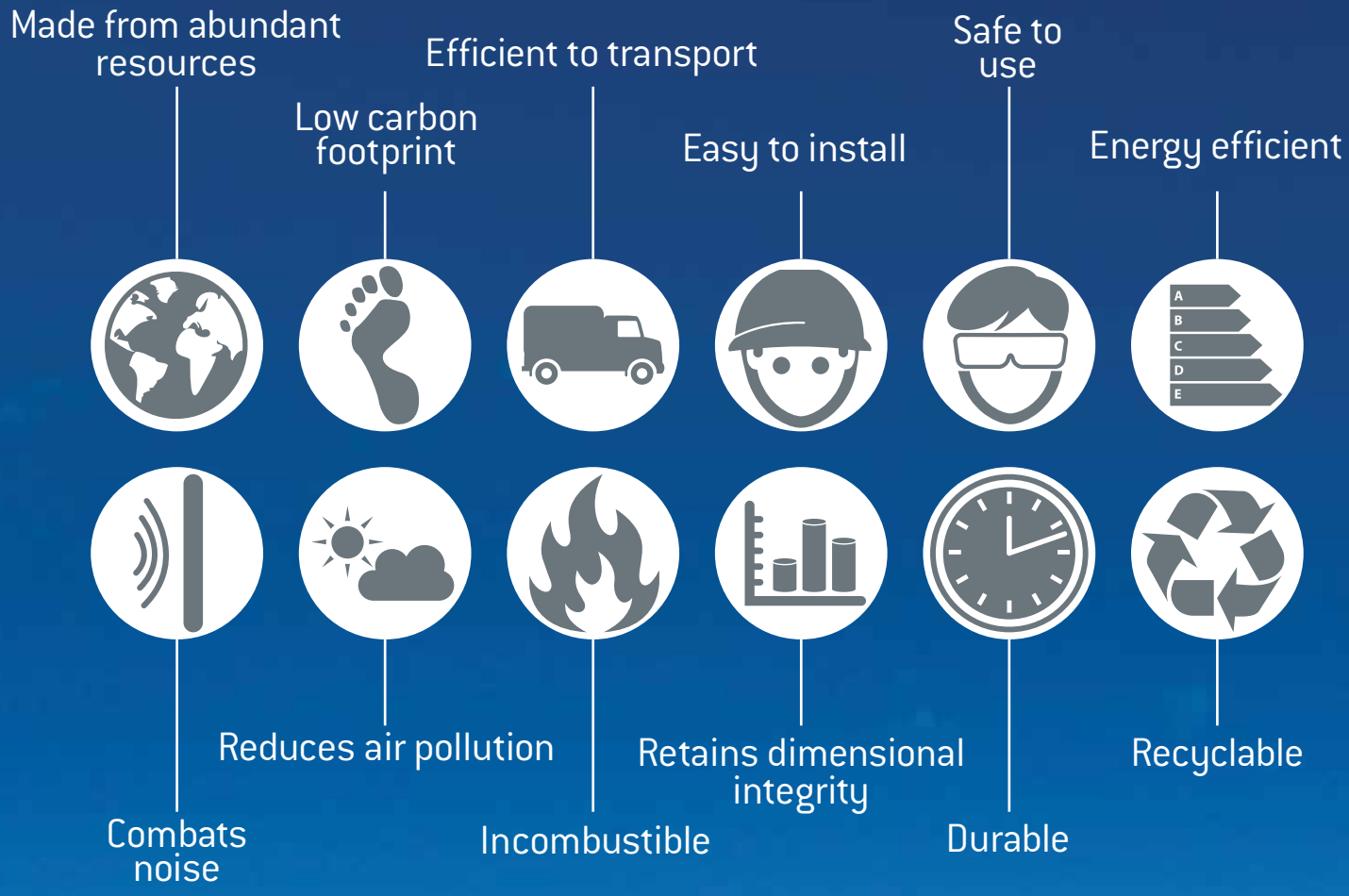
Mineral Wool | **Putting Natural Resources to Work for the Benefit of our Planet**



Mineral wool insulation is made from resources abundant in nature, the reserves of which will last us for millions of years. It uses very little energy to transport or to be put in place, it is easy to install and safe to use. It makes buildings energy efficient, combats noise and reduces air pollution, it is incombustible and retains its dimensional integrity throughout its entire durable life, whilst providing comfort, and leaving an overwhelmingly positive net carbon footprint. When the building's lifetime comes to an end, it can be recycled into new mineral wool, or converted into other useful products that contribute to a sustainable solution.

How many products like this do you know?

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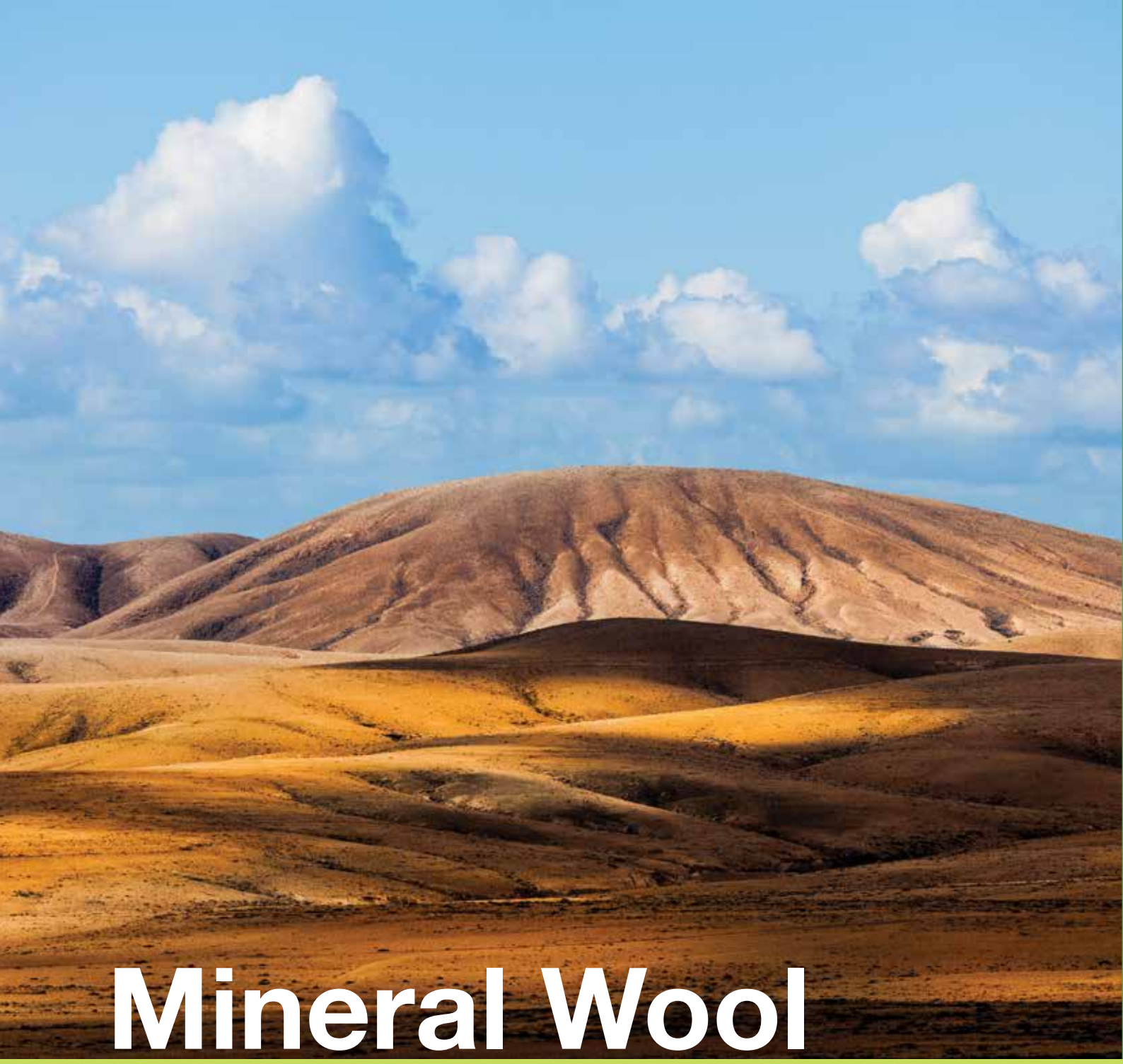


Mineral Wool

at a glance

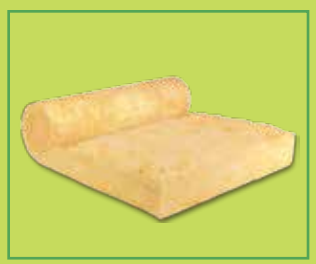
Mineral wool insulation can be divided into two main product categories: glass wool and stone/slag wool. Glass wool is made from sand and recycled glass, the same ingredients used in objects such as glass bottles. Stone wool is made from volcanic rock, typically basalt or dolomite, and an increasing share of recycled material in the form of briquettes.

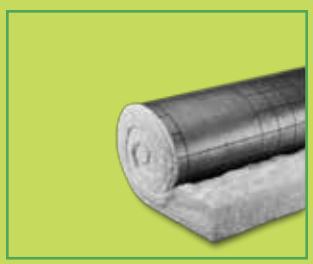
The benefits of mineral wool insulation throughout its various life-cycle stages (that include material extraction, production, its actual use and end-of-life recovery) are at the heart of its contribution to the "triple bottom line" of sustainability (environment, society, economy).

Through its unique combination of thermal, fire and acoustic properties, mineral wool insulation is specifically "fit-for-purpose" against low recurring expense and maintenance, making it the **customer's material of choice**. These **exceptional properties** come from the fibre-like structure that prevents the movement of air, and from mineral wool's inert chemical composition.

It is a very **versatile material**, and can be manufactured in many different densities to offer customised shapes and performance levels. The range of products includes loose granular material which is used for blown insulation of cavity walls, slabs for walls, rolls for loft insulation, pre-formed and faced pipe sections, ceiling tiles and acoustic panels.

Glass and stone wool products are used in essentially the same applications, with the largest volume going into **thermal insulation of buildings**. This is why we have taken the building application as a starting point for this brochure.





Introduction: Sustainability

the ultimate driving force for buildings

Take a look around you. You are most likely in a building while reading this. Nowadays people spend nearly 90% of their lives indoors. Throughout history, buildings have developed from simple shelters to today's more modern, comfortable and functional dwellings.

The increasingly important role buildings play in the overall socio-economic evolution of our society cannot be ignored: while **personal comfort and well-being were originally the sole drivers** for their development, **concerns over energy costs, air pollution and quality, climate change** and **scarcity of resources** have given the economic and environmental dimensions of buildings an equal importance.

In 1973, the first European oil crisis brought energy dependence and energy costs linked to heating and cooling houses to the fore, **resulting in an accelerated use of thermal insulation in buildings**, starting with pitched roof insulation, and the development of always tighter thermal regulations.

Throughout decades of increasing environmental, societal and economic concerns, mineral wool insulation has always been an essential part of the buildings solution - whether the issue was confort, fuel poverty reduction, air quality, climate change mitigation, job creation or resource efficiency. Indeed, **mineral wool insulation has always been closely related to all three pillars of sustainable development.**

Buildings' multi-facetted impact on sustainability... which means increased demand for mineral wool

1950s: Comfort

1970s: Energy prices/supply

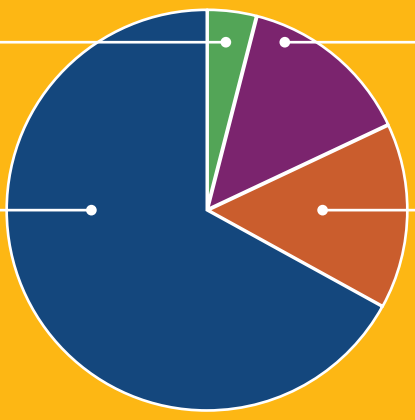
1990s: Air Quality

2000s: Climate Change

2008: Economic crisis

2010s: Resource Efficiency

Energy use in buildings



Source: European Commission

Energy use has traditionally been considered the most prominent effect that our buildings have on sustainability. **Buildings consume energy. Lots of it!** Across the European Union (EU) buildings[1] are responsible for approximately 40% of total energy consumption. This is more than for transport (33%) and industry (26%). Nearly 70% of this energy consumption is used for heating and cooling our homes, offices and schools. **Today, approximately 85% of the energy use in a building can be found in its "use-phase"** while the remaining 15% is concentrated in energy used for the manufacture of the constituent building materials[2].

Recent years have witnessed the re-enforcement of European and national policy initiatives, incentive schemes, legislation and standards, pushing for the **reduction of energy consumption of the housing stock**.

The recent EU legal obligation for **all new constructions to be "nearly-zero-energy buildings" as from 2021** and the obligation for Member States to draw national long-term strategies for the refurbishment of their building stock are vital in this respect. Further, more specific initiatives that target the **deep renovation of the existing housing stock** would be **needed to structurally reduce energy consumption in buildings**, especially by maximising the energy performance of the **"building-envelope", where the biggest potential lies**.

The impact of buildings, however, is not limited to the environmental pillar of sustainability, but also relevant on the social and economic sides. The **construction sector** -which generates **almost 10% of EU's GDP** and provides **20 million jobs**, mainly in micro and small enterprises[3]- has been badly affected by the crisis. There is a growing consensus that the economic activity generated by a wide-ranging **EU scheme for building refurbishment** would be key in order to put back to work millions of EU citizens, while making a **substantial contribution to the reduction of EU energy imports** and **cutting energy spending** in European homes.

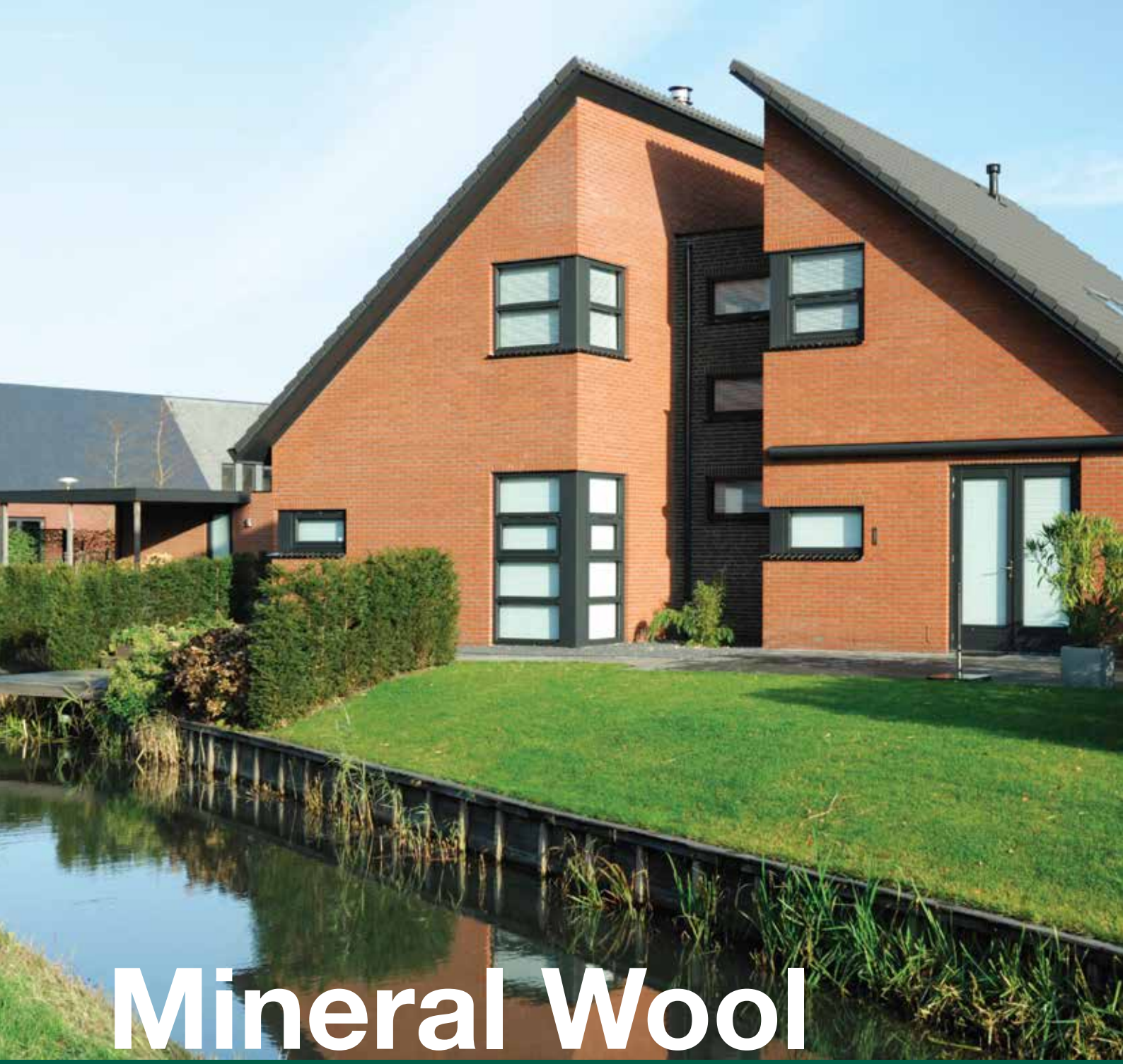
Last, but not least, recent **EU initiatives on resource efficiency** have put the spotlight on the need to change our current patterns of **resource use, as a key contribution towards a sustainable future**.

The European Mineral Wool industry believes that:

- **using fewer resources**
- **using better resources**
- **making better use of resources**
- **making better products**

will lead to increased competitiveness and sustainable growth.

This conviction is the red thread of the sustainable construction approach of the European Mineral Wool industry.



Mineral Wool Insulation:

the natural sustainable solution

Apart from its contribution to the sustainability of the individual dwelling, mineral wool insulation makes a substantial contribution to the triple bottom-line of planet, people and profit which is reflected in the three pillars of overall sustainability; namely environmental, social and economic.

From the environmental perspective

(Page 12 of this brochure):
mineral wool contributes to all global priority areas

Resource Efficiency: mineral wool is derived from raw natural materials (sand, dolomite, limestone and basalt) which are found in abundance across the globe[4]. Mineral wool is also increasingly made from recycled materials.

Energy Efficiency and Energy Savings: once converted into mineral wool insulation, these abundant resources avoid significant wastage of other valuable (non-renewable) resources such as gas and oil used for heating and cooling. In fact, more than 50% of the energy used in buildings could be reduced by insulation[5]. Taking into account that buildings are responsible for 40% of EU's final energy use, these savings can be significant.

Reduction of CO_2 emissions: similarly, buildings are responsible for 36% of the EU's CO_2 emissions. Available solutions such as mineral wool insulation could reduce CO_2 emissions by 42%[6].

From the social perspective

(Page 22 of this brochure):
mineral wool provides comfort, health, safety and economic savings

A healthy indoor environment: mineral wool insulation helps maintain an even, steady temperature in all rooms and eliminates drafts and cold spots.

Reduced outdoor air pollution: EU cities' inhabitants will experience positive health effects due to the significant reduction in the ground-level mass concentration of main air pollutants. This can be seen when comparing scenarios in both insulated and non-insulated buildings[7].

Less noise pollution: by entrapping air between its fibres, mineral wool insulation minimises noise transmission in the home, from both indoor and outdoor sources.

Fire Safety: mineral wool insulation acts as a barrier to heat conduction. In fact, the raw materials used in its manufacture are inherently non-combustible.

Saving household expenses: by directly reducing energy consumption for heating and cooling, mineral wool insulation reduces the risk of fuel poverty by significantly lowering the energy bill of the insulated building's inhabitants. Between 50 and 125 million people in Europe are currently estimated to be fuel poor[8].

From the economic perspective

(Page 24 of this brochure):
mineral wool insulation contributes to the economic development of our society from both a macro and microeconomic perspective

On the macro-economic side: insulating buildings with readily available and practical solutions such as mineral wool contributes to lowering EU energy imports. Currently, the EU imports over 60% of its gas and over 80% of its oil[9].

In addition, building renovation has proven to be a wealth-creation activity. In fact, according to the International Labour Organisation (ILO), Germany's building renovation programme has already mobilised some €100 billion in investments, yielding around 300,000 direct jobs per year[10].

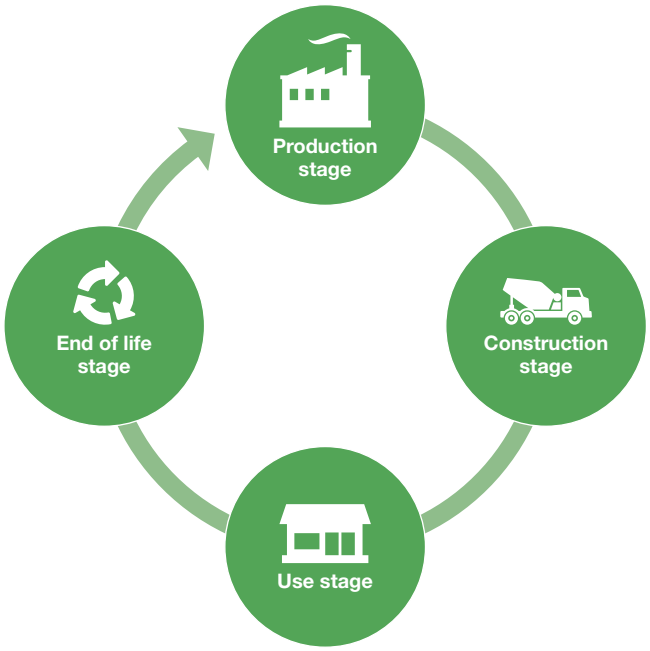
On the micro-economic side: mineral wool provides durable benefits for homeowners and occupiers. The European Commission estimates that energy efficiency in buildings could save €600 per household by 2020[11].

To summarise, mineral wool insulation transforms buildings from energy and resource wasters into climate and economy savers, contributing to our well-being as home owners or occupiers and making overall social and environmental development fully compatible with economic growth.

Environmental Sustainability:

Mineral Wool's commitment to Life Cycle Assessment

In order to assess the environmental sustainability of a product, each of its positive and negative impacts on the environment from "cradle-to-grave" must be carefully valued.



This needs to be done from an **objective, sound, science-based perspective**, following commonly accepted evaluation mechanisms. Life Cycle Assessment (LCA) is widely recognised as the best way to make a scientific assessment of the environmental impact of products, systems, building elements and buildings.

At product level, a LCA is an inventory of its impact throughout its life - from the extraction of raw materials to the product's end of life following demolition or de-construction of the building. It is measured at each stage with 24 different standardised indicators[12] linked to issues such as waste, emissions and consumption of resources, etc.

LCAs provide valuable input for the assessment of the environmental performance of buildings[13] and are the best science-based approach to supply information on products if carried out according to existing international standards.

Mineral wool producers are committed to LCAs and the use of related Environmental Product Declarations[14] (EPDs).

The mineral wool insulation industry has produced a generic LCA and its corresponding EPD, thoroughly analysing the main four phases of its products life-cycle.

In the following chapter, we will summarise the main findings of the mineral wool Environmental Product Declaration.

Life-Cycle Assessments: the Mineral Wool industry's viewpoint

Much more than a comparison tool

There is a common belief that the main and possibly only purpose of an LCA is to compare a product's s environmental performance. This is however not the case. LCAs provide a standardised and sound basis for an industry to assess the entire whole "cradle-to-grave" life of its products and to identify ways of improvement. The LCA results must be solid and peer-reviewed and this is why all LCAs and EPDs for external purposes should undergo independent third-party verification.

LCA results should be "handled-with-care" in comparative use. Only functionally fully equivalent alternatives and individual impact indicators calculated and expressed in a standardised form can provide an objective basis for comparison. One product may be good on one impact criterion, but not as good on another. Furthermore, a product needs to be assessed in the context of the application it is being used for in a building.

The mineral wool industry supports the development of LCAs for insulation products and publication according to the EN15804 standard, and believes this is the only tool offering a consolidated assessment at building level.

Assessment at product or building level?

The mineral wool industry considers that, since a significant proportion of environmental impacts of a building occur during its use stage, priority should be given to the building level before considering the product level environmental performance.

Setting first-line requirements at building level ensures maximum contribution of products to the overall environmental performance of a building. Construction products require a specific approach in terms of assessment and certification, as they are intermediate products whose environmental contribution to the overall performance of a building must be assessed first. Only the building itself is the final product.

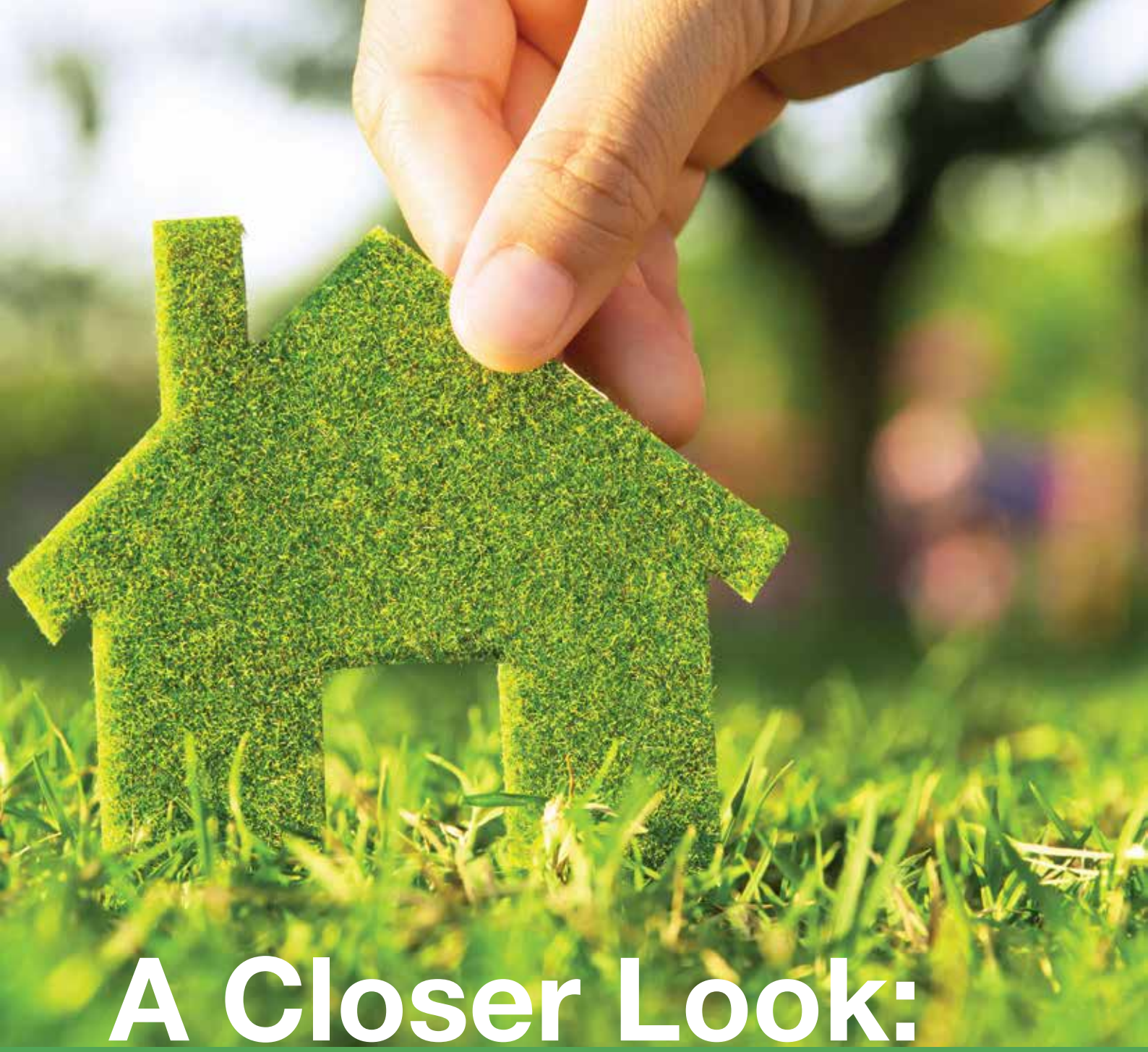
Labelling and standards: Need for harmonisation

The mineral wool industry recognises that worldwide, there is an increasing pressure on the market to develop sustainability evaluation and labelling schemes both for products and buildings. At the same time, we disagree with the mushrooming of labels at national, regional or even local level and think that harmonisation is thus needed.

Harmonised European standards designed to assess the sustainability of construction works (standards of the CEN/TC 350 committee) have been in development since 2004. While the social and economic sections are yet to be finalised, the environmental part related to buildings and construction products is available.

How "green" is "green"?

LCAs and corresponding EPDs should become the basic tool to avoid false environmental claims: so-called "green" products must be analysed under the LCA lens, as the only trustworthy way to demonstrate their "environmental friendliness". The same applies to "green" labels: in order to be considered as a reliable way of assessment for consumers, they should fully evaluate all elements of the products' LCA within the building context.



A Closer Look:

The Mineral Wool life cycle in its various phases

The Mineral Wool industry has developed a third party verified LCA and respective EPDs. In this section we will see in detail how mineral wool insulation fares in its four basic phases:

The production stage	involves the raw material supply (extraction, processing, secondary resources and recycled material), transport to the manufacturer, internal transport and the manufacturing itself.
The construction stage	includes transport to the building site and installation in the building.
The use stage	entails the application, maintenance, repair or replacement, refurbishment, operational energy use and operational water use.
The end-of-life stage	includes the deconstruction or demolition, transport to end-of-life, waste processing for reuse, recovery or recycling and disposal.

Production stage

One of the strong points of mineral wool is its raw material sourcing. The materials from which mineral wool insulation is made are virtually inexhaustible[15] resources that have been around and will be around for millions of years. In addition, mineral wool products are manufactured using an increased proportion of recycled material.

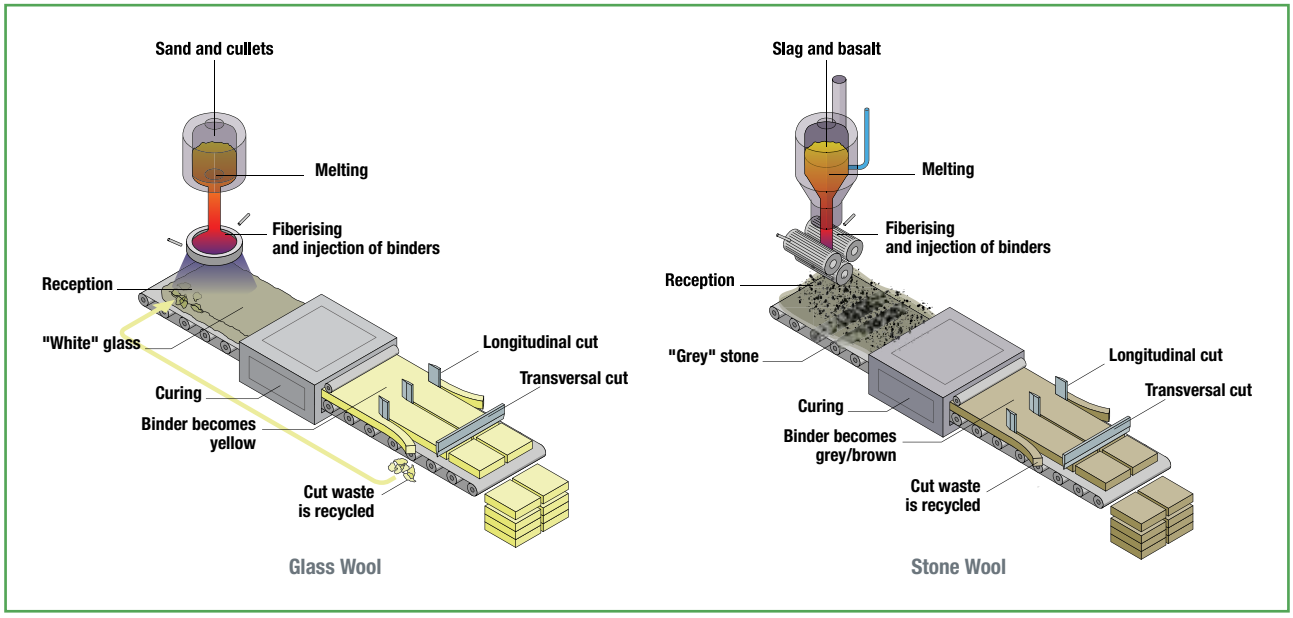
The main components of mineral wool are **inorganic minerals (sand, stone)** and a low percentage of binder.

Mineral wool is free from substances of very high concern.(SVHC[16])

Additives such as fire retardants are not necessary to ensure or improve the fire safety of mineral wool as the mineral composition provides a non-combustible product. There is also no need to add substances to keep the insulation free from mould and insects.

Today's manufacture of mineral wool insulation **relies heavily on recycling**. In fact, **recycled material** currently accounts for between 30% and 60% of the mineral wool insulation manufacturing input streams and **can reach levels of 80% or even higher**.

Recycled glass (post-consumer flat and container glass or flat glass waste from flat glass production) is extensively used as a raw material for producing glass wool. Stone wool processes **include the use of product waste** bonded into **briquettes**, of similar approximate size to the lump of rocks.



Manufacturing mineral wool involves the following steps:

Step 1: Melting

The mineral wool sector uses oxygen-gas, electrical furnaces and hot blast cupolas with cokes for its production.
Following the melting stage, the processes and environmental issues are essentially identical.

Step 2: Forming: fiberisation of the melt, binder application, product mat formation

The melt from the glass or stone wool furnace flows into specially designed rotary centrifugal spinners. This forms a veil of fibres, which passes through a ring of binder sprays that release a solution of binder and mineral oil onto the fibres to provide integrity, resilience, durability and handling quality to the finished product.

Step 3: Curing: cooling, and product finishing

The resin-coated fibre is drawn under suction onto a moving conveyor to form a mattress of fibres. This mattress passes through a gas-fired oven, which dries the product and cures the binder. The product is then air-cooled and cut to size before packaging.

Edge trims can be granulated and blown back into the fibre veil, or they can be combined with the surplus product to form a loose wool product.

In the mineral wool sector, the emissions to air can be divided into emissions from melting activities, and emissions from downstream processes.

Curing oven emissions contain volatile binder components, binder breakdown products, and combustion products from the oven burners. These emissions are minimised by appropriate techniques for handling and spillage containment, and residual levels of pollution can be treated with standard techniques.

Typical techniques for reducing the emissions are impact jets and cyclones, wet scrubbers, wet electrostatic precipitators, stone wool filters and waste gas combustion.

For new plants, the best available technology, as described in the "Best Available Techniques (BAT) Reference Document for the manufacture of Glass" must be used. The application of the BAT has resulted in a considerable reduction in emissions over the last decade.

Emission	Reduction over the last decade
NOx	-30%
SOx	from -30 to -80 %
HCl	-60%
H2S	-60%
Phenol	-30%
Formaldehyde	-50%

Construction stage

To have a net positive impact on sustainability, a material must be easy to transport. Mineral wool insulation fits the bill nicely, because its fibre mats are compressible… **by a factor up to 10!**

Compressibility reduces the number of truckloads required to transport insulation to the building site. Fewer truckloads mean fewer trucks which, in turn, means **less fuel and exhaust emissions**.

Good product design reduces waste during installation. Mineral wool can be purchased in different sizes and thicknesses. Installation waste is therefore minimised and can be returned to the manufacturer for recycling.

Mineral wool products are developed to live up to **the highest health and safety standards** for both installers and users.

As regards handling practices, producers have committed themselves to developing **pictorial packaging communication standards** to ensure that the installers are free from any discomfort.

Safe Use Instruction Sheets similar to safety data sheet are also available from each producer.

Use stage

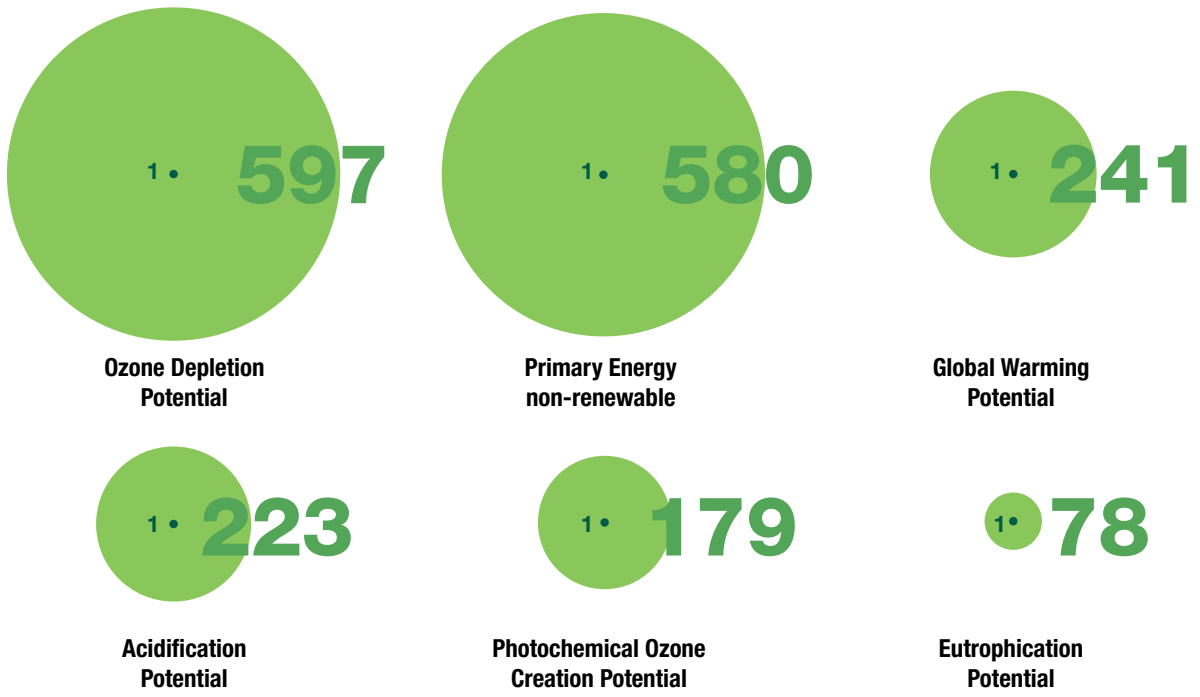
Mineral wool is fantastic. It requires no maintenance or replacement once incorporated into the fabric of a building. It does not need additional energy, material or water to keep it in good working order (reference EN 15804). In addition, mineral wool products (under CE marking) assume a working life that equals or exceeds the buildings lifetime.

In fact, once installed, mineral wool delivers the lion's share of its contribution to sustainability. **The reduced energy demand** and **CO_2 emissions of buildings** during the **use phase** by far **outweighs** the **environmental impact** of **manufacturing mineral** wool insulation.

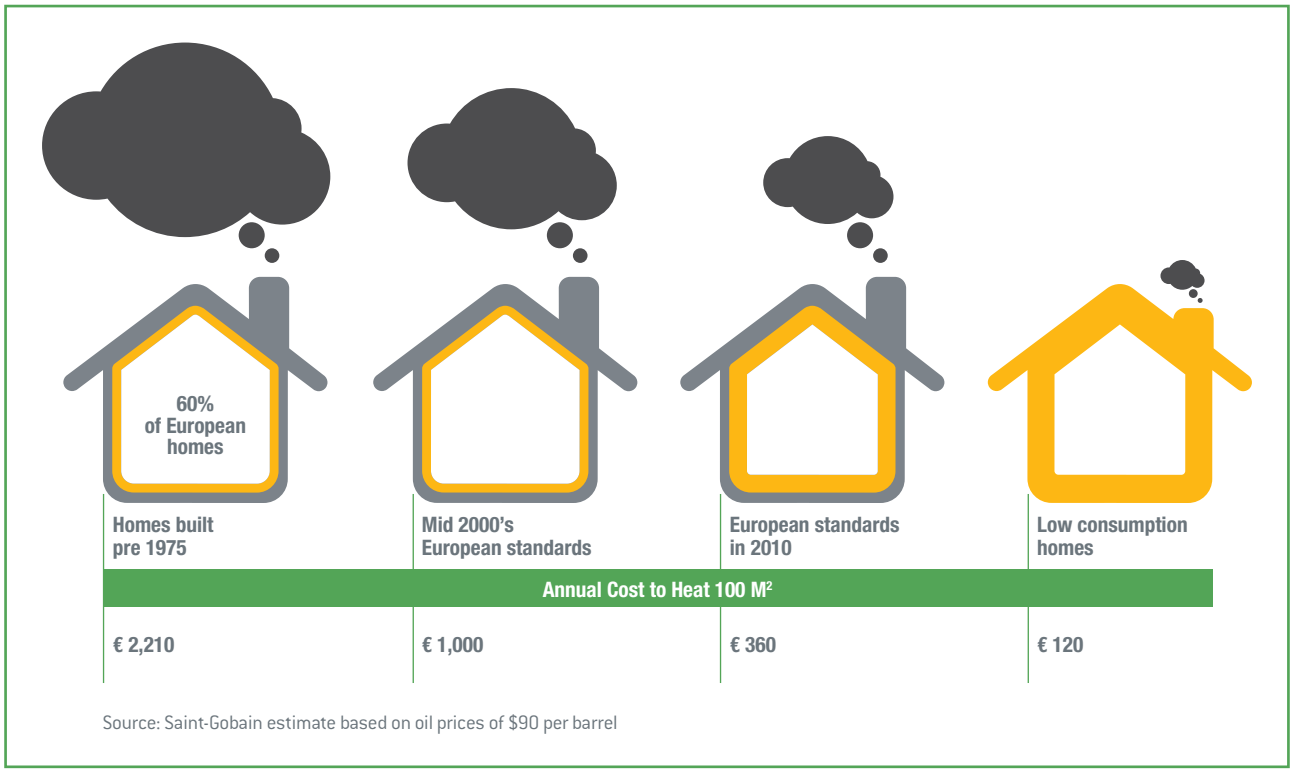
Over the 50-year lifetime of a home, mineral wool insulation can **save more than 200 times** the CO_2 emissions that are generated during its manufacture, transportation, installation and disposal.

The following graph, based on the EURIMA mineral wool LCA calculations, compares the environmental impacts and savings during the life-cycle of mineral wool products in a standard building (located in Strasbourg, France). As it can be clearly seen, the negative impact on various parameters during production and construction is overwhelmingly compensated by the savings provided during the use phase (especially on Global Warming Potential, Primary Energy Use, and Ozone Depletion Potential). For this case study, the heating system was based on an assumption of 50% gas and 50% electricity, and calculations were based on a renovation scenario, going from "no insulation" to R-values 5 and 3 respectively in roof and wall.

Ratios for energy related environmental impact indicators



Reducing CO_2 emissions and energy spending from buildings is the right priority… before being forced to cut elsewhere.



Source: Saint-Gobain estimate based on oil prices of $90 per barrel

A family who choose to modernise their 40+ year old, poorly insulated house to high energy efficiency standards can, for instance under German conditions, save some 11 tonnes of CO_2 per year. In order to save the equivalent amount of CO_2, this family would need to give up their two modern medium-sized cars, skip two annual flights from Munich to Mallorca, stop eating beef and start taking cold showers!

End of life stage

The Mineral wool waste management covers four steps of the EU waste hierarchy: Prevention, Reuse, Recycling and Disposal.

At the end of a building's life, **mineral wool insulation** can be folded back into the system, **reused as insulation** in a new building, **recycled into new mineral wool**, or **converted into other useful products** that contribute to a sustainable solution.

The aim is to **minimise landfill** and to **maximise the recycling of mineral wool** at the end of its life. In order to achieve this, mineral wool producers are continuously looking at feasible solutions to facilitate the collection, transportation and recycling of mineral wool at the end of its life.

Social Sustainability:

Mineral Wool well-being materialised

No home can be considered truly "sustainable" unless it provides a comfortable environment for its occupants. Although definitions of "comfort" can vary widely, all definitions include thermal and acoustic comfort and fire-safety - all considered being the prime strengths of mineral wool insulation. **Annoying drafts and cold spots can make any home difficult to live in** and are at the origin of many health concerns and related costs. Noise, whether airborne or structure-borne, has been proven to adversely affect the physical and mental well-being of a building's occupants.

When used in conjunction with sensible building practices, **mineral wool insulation helps maintain an even, steady temperature from room to room**. By entrapping the air between its fibres, mineral wool insulation minimises noise transmission in the home from both indoor (room-to-room and floor-to-floor) and outdoor sources (for example, from street and air traffic and noisy neighbours).

Indoor Environment & Health

In addition to its comfort, cost-saving, and fire-protection benefits, mineral wool insulation **contributes greatly to a quality indoor environment**. For example, more than 95% of mineral wool insulation products are made of inorganic fibres; thus minimising the moisture and nutrient conditions necessary for fungal growth. Mineral wool fibres have been evaluated and classified by the Registration, Evaluation, Authorisation and Restriction of Chemical substances system (REACH) and Global Harmonised System (GHS) as "non-physical hazardous," "non-health hazardous," and "non-environmental hazardous."

Reduction of fuel poverty

The prices of electricity, gas and other fuels such as coal are on the rise, and this trend looks likely to continue. Therefore, there is an **urgent need to protect vulnerable consumers** in order to prevent situations of energy poverty.

Fuel poverty is a serious problem throughout the EU, and it should be addressed through intervention on policies such as social welfare, energy prices and tariffs and domestic energy efficiency, with particular emphasis on heating and insulation improvements[17].

Fire Protection

Mineral wool insulation acts as **a barrier to heat conduction**, and the raw materials used in its manufacture are inherently non-combustible. As a result, mineral wool insulation offers **a high degree of passive fire protection** wherever it is installed. It does not produce toxic fumes or falling hot droplets if a fire occurs.

Outdoor Air Quality

Mineral wool insulation contributes to outdoor air quality.
A recent study from the Danish Meteorological Institute (DMI)[18] considered the effects of building insulation on ground-level concentration levels of air pollutants. It estimated the reductions in energy consumption when comparing business as usual with very low energy building scenarios between 2005 and 2020 as regional averages in the EU-25. The results revealed statistically significant changes in ground-level mass concentration of main air pollutants when comparing the insulated and non-insulated scenarios:

- **Emission reductions of up to 9%** in particulate matter and **6.3%** for sulphur dioxide were found in North Western Europe.
- **Carbon monoxide decreased by 0.6%** over southern Europe while nitrogen oxides changed up to 2.5% in the Baltic region.
- Seasonally and regionally averaged changes in ground-level mass concentrations showed that **sulphur dioxide decreased by up to 6.2%** and **particulate matter by up to 3.6%** in Northwestern Europe.
- **Nitrogen oxide** concentrations **decreased by 1.7%** in Poland and increases of up to 0.6% were found for ozone.

Eurima pictograms on the voluntary labelling of Mineral Wool insulation products

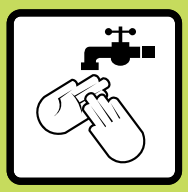
Being responsible also means communicating responsibly. When it comes to safety, Eurima members are staying ahead of the game by developing pictorial packaging communication standards to ensure that the installation is safe, clean, and conforms to local regulations.

Safe Use Instruction Sheets similar to Safety data sheet are also available from each producer. Information that can be seen on the packaging of mineral wool products in Europe, is either the text below or the pictograms with respective explanation:

"When installing insulation in unventilated spaces, wear a suitable disposable face mask. When handling products, cover any exposed skin. Wear goggles when working with products overhead. Dispose of waste in accordance with local regulations. Clean the area using vacuum equipment. If itching occurs, it may be alleviated by rinsing in cold water prior to washing."

"The mechanical effect of fibres in contact with skin may cause temporary itching"

Cover exposed skin. When working in unventilated areas, wear a disposable face mask.



Rinse hands in cold water before washing.

Clean the area using vacuum equipment.

Ventilate the working area if possible.

Dispose of waste according to local regulations.

Wear goggles when working with products overhead.

European mineral wool insulation producers have voluntarily established and developed the European Certification Board for Mineral Wool Products (EUCEB). This is a means of certifying that the insulation is manufactured to meet European requirements and regulations related to product health and safety (Note Q of Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances). EUCEB certification promotes quality manufacturing and fibre-composition according to a precisely defined system of monitoring and controls, and only those manufacturers who meet the EUCEB requirements are allowed to use the EUCEB trademark on their packaging.

For more information, see: www.euceb.org

THE NOISE FACTOR

80 million EU citizens are exposed to noise. Further 170 million live in acoustic grey zones that seriously affect people's well-being. Result of this is a negative health impact: the EU's GDP is cut by an estimated 0.2% to 2%. Annual follow-up costs: well over 12 billion Euro.

Economic Sustainability:

Mineral Wool, a committed industry

Mineral wool insulation contributes to an overall reduction in societal energy use… and it does so one home, one school and one office building at a time, thus, providing direct increase of disposable income to its occupants.

Lowering energy imports, which the European Commission estimates to

€400 billion

annually

For individual households, energy efficiency in buildings through **measures such as mineral wool insulation contributes** to significant **monetary savings - up to €600 per year** per household[19]).

For society as a whole, lowering energy imports, which the **European Commission estimates to amount to €400 billion annually**, would directly translate into available funds that could be injected into the EU's economy. Insulating buildings with mineral wool can reduce energy demand significantly. Research from Ecofys has shown that **deep renovation of buildings can cut energy use for heating and cooling of the EU building stock by 80% by 2050**[20]. This would stop the EU from paying billions of Euros while making them available for qualitative and sustainable local growth. The economic value of avoided CO_2 emissions is equally significant for the society as a whole while better living comfort and conditions will see a reduction in public health spending.

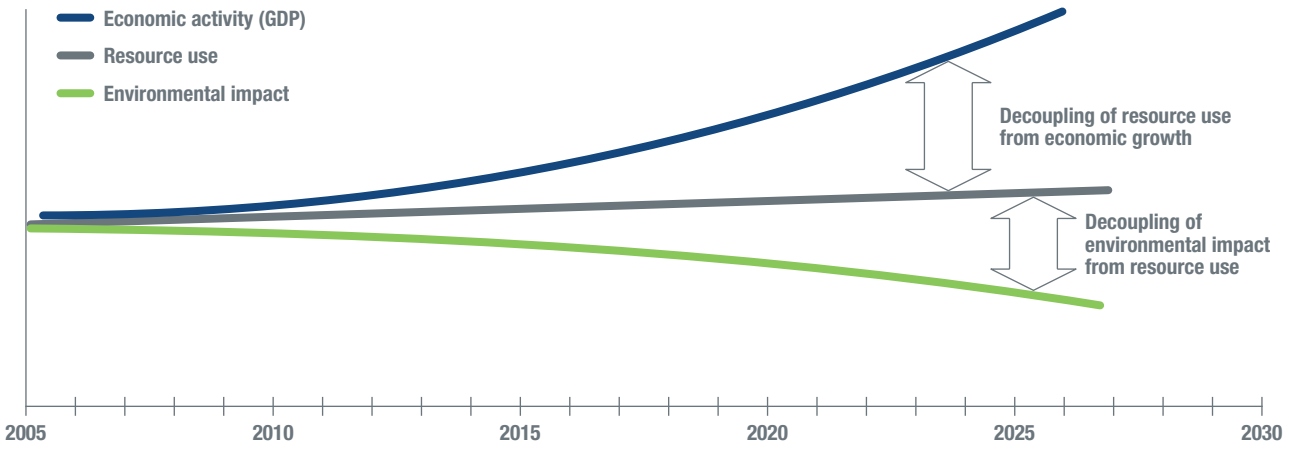
The construction sector plays an important role in the European economy. It **generates almost 10% of GDP and provides 20 million jobs**, mainly in micro and small enterprises[21]. However, the economic and financial crisis has hardly hit this area of activity (building and infrastructure works fell by 16 % between January 2008 and November 2011 across the EU-27[22]).

The **renovation** of the EU's building stock is widely perceived as an **essential element to create millions of local, stable jobs** and to kick-start Europe's economy.

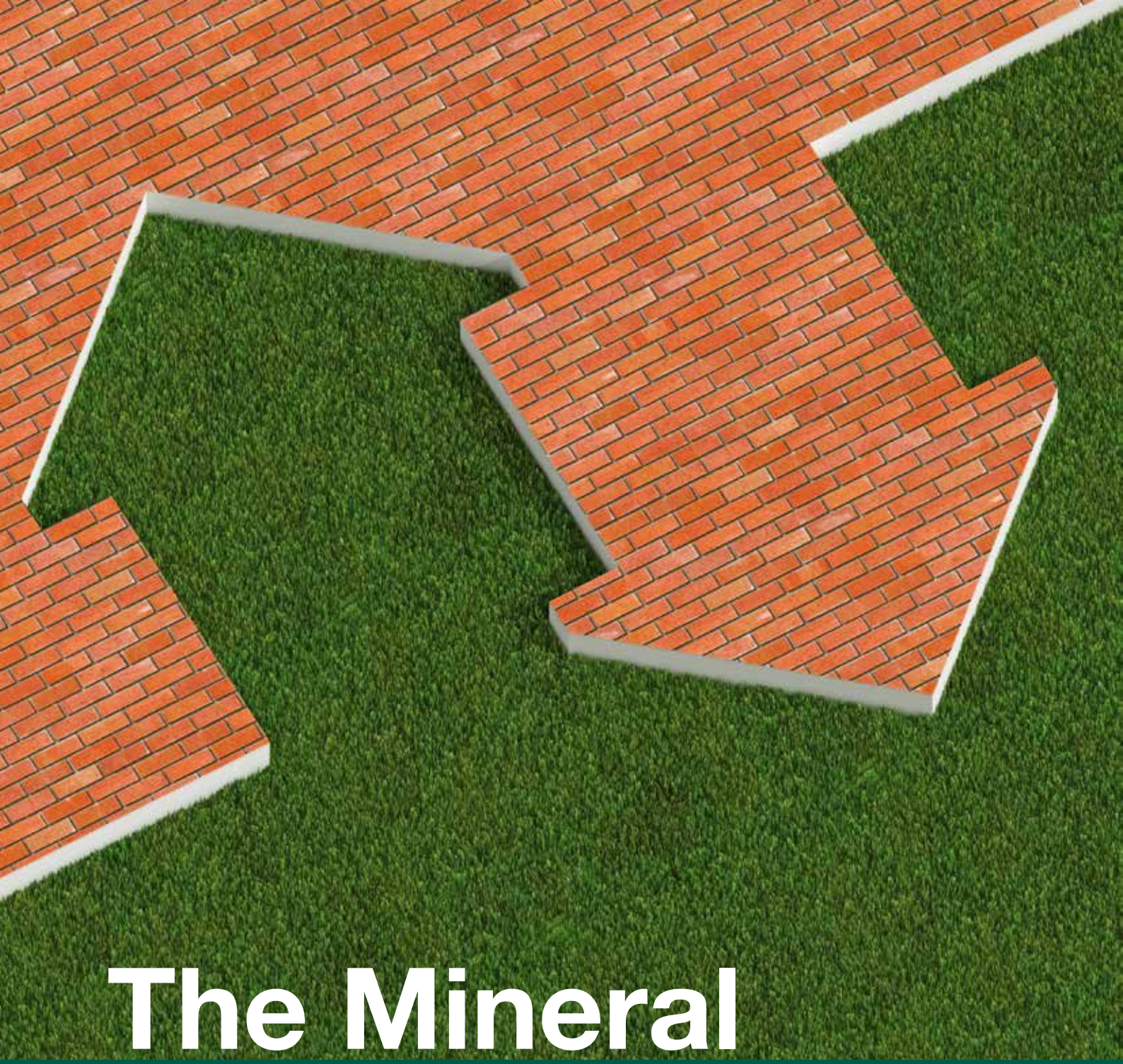
Building renovation activities have also proven to be highly beneficial in economic terms for public authorities. A recent study[23] from **Jüllich Research Centre on the German KfW-Bank** building renovation programme has shown that, **for each Euro invested in building refurbishment**, public authorities **received (in the same year) 4 to 5 Euro** in the form of additional tax revenues and social security contributions and reduction of unemployment subsidies.

We must also take into account that most energy resources are now scarce, not only fossil, but also nuclear. **Using resources abundant in nature to reduce energy demand** is therefore **one of the most effective ways** for attaining the much needed "double decoupling" in our economy. This makes economic growth independent from resources used and even more so from environmental impact.

The construction sector generates almost 10% of GDP and provides 20 million jobs



Source: European Commission



The Mineral Wool Industry:

a knowledge-based approach to sustainability

The correct thermal and acoustical insulation of the building envelope, increasing the health and safety of the buildings' occupants and efficient production are important, but not sufficient. Insulation is only one element of the sustainable construction building chain. It is important to note that the use of sustainable building materials does not always result in sustainable buildings while, on the contrary, it is technically possible to make sustainable buildings from unsustainable products. **A sustainable building is a holistic concept where good functional and technical design fits the needs over their long lifetime and products used are installed to deliver their maximum contribution.**

Standard setting for building products takes place in CEN, the European standardisation body. Mineral wool producers participate actively in promoting strict standards in terms of

building and insulation performance, fire protection, acoustical performance, environmental and health standards, and now sustainability standards. **Mineral wool producers** also explicitly **promote third party control over the declared properties of the products**. The mineral wool producers participate via their national standardisation body and they provide expertise in various standardisation committees.

The mineral wool industry is convinced that **sound knowledge** is the best possible base for any policy development and in the case of a **complex matter such as the energy savings** in buildings, this is even more **necessary**.

This is why for over a decade Eurima, supported a series of publications issued by Ecofys on energy performance of buildings and its influence on Climate Change. This series of nine research studies quantified the **potential of energy savings in buildings**, the **economics of these savings**, and the **policy instruments needed**.

Eurima has also supported **research into the economic and financial issues related to building renovation**. In 2011, Ecofys carried out for Eurima the report: "Economics of deep renovation", which details the economic feasibility of deep renovations for single and multi-family homes across the EU, taking a case-study analysis as its basis. More recently, Eurima and Climate Strategy & Partners published a study on the financial mechanisms that are needed for the renovation of the EU's building stock.

All Eurima studies are available for public information in our website: www.eurima.org

Environmental Product Declaration of Mineral Wool Produced in Europe. In accordance with EN 15804 and conforming to ISO 14025

30-11-2012

Ecofys X: Renovation Tracks for Europe: Building renovation in Europe – What are the choices?

27-07-2012

Comparison of test methods to evaluate fire performance of ETICS

28-06-2012

Building Certification Systems: Analysis of five approaches to environmental assessment of building components in a whole building context

30-05-2012

Financing Mechanisms for Europe's Buildings Renovation

09-02-2012

Ecofys IX: Economics of Deep Renovation

01-02-2011

Ecofys VII: U-values for Better Energy Performance of Buildings

27-11-2007

Better buildings through energy efficiency: A Roadmap for Europe

02-03-2007

Ecofys VI: Sensitivity Analysis of Cost Effective Climate Protection in the EU Building Stock

06-06-2006

Ecofys IV/V: Cost-Effective Climate Protection in the Building Stock of the New EU Member States

19-09-2005

Ecofys III: Cost-Effective Climate Protection in the EU Building Stock

16-03-2005

Ecofys II: Mitigation of CO_2 Emissions from the Building Stock - Beyond the EU Directive on the Energy Performance of Buildings

04-03-2004

Ecofys I: The Contribution of Mineral Wool and other Thermal Insulation Materials to Energy Saving and Climate Protection in Europe

16-12-2002

Countries with mineral wool production facilities

Eurima in a Nutshell

What is Eurima?

Eurima is the European Insulation Manufacturers Association. It represents the interests of all major mineral wool insulation producers throughout Europe. Eurima members employ over 21,000 people across Europe, with the installation of insulation products accounting annually for an estimated 300,000 man-years.

Eurima members have a total of 58 production facilities in the countries marked in light green on the map above and operate in all European countries. For more information about Eurima, member companies and partners, and additional publications, please visit our website: **www.eurima.org**

Associated Members - Companies

fibran
FLUMROC
GLAVA
ISOVER SAINT-GOBAIN
IZOCAM
KNAUF INSULATION
PAROC
ROCKWOOL
simply better insulation SAGER
URSA uralita

Affiliated Members - Companies

OWA

Affiliated Members - National Associations

afelma
ASOCIACE VÝROBCŮ MINERÁLNÍ IZOLACE
ESTISOL
FINNISOL
filmm
FMI Fachverband Mineralwolleindustrie e.V.
F.I.V.R.A
Latisol - Latvian Isolation Manufactures Association
MBR
MINERALINĖS VATOS GAMINTOJŲ ASOCIACIJA
mima MINERAL WOOL INSULATION MANUFACTURERS ASSOCIATION
MIWO
MWA
NORIMA
РОСИЗОЛ
Swedisol
swissisol

Global Network

// ABRALISO

ICANZ
THE RIGHT INSULATION MATTERS

AFLARA

MIMG FMM-MALAYSIAN INSULATION MANUFACTURERS GROUP

NAIMA CANADA

ロックウール工業会

NAIMA
North American Insulation Manufacturers Association

eurima
European Insulation Manufacturers Association

Footnotes

[1]"Energy Efficiency Plan 2011, European Commission, March 2011

[2]"Life-Cycle Assessment and the Environmental Impact of Buildings: A Review". Sustainability Journal, Volume 1, Issue 3 (September 2009), p. 335-788

[3] European Commission's Communication COM(2012) 433 final "Strategy for the sustainable competitiveness of the construction sector and its Enterprises", 2012.

[4] Tais W. Dahl, et al., "The human impact on natural rock reserves using basalt, anorthosite, and carbonates as raw materials in insulation materials," International Geology Review, Vol. 53, No.8. July 2011, 894 - 904

[5]"The Contribution of Mineral Wool and other Thermal Insulation Materials to Energy Saving and Climate Protection in Europe" Ecofys, 2002.

[6] Ibid

[7]"Influence of Increased Insulation Levels on Regional Air-Quality", Danish Meteorological Institute / Ecofys, 2009

[8]"Tackling Fuel Poverty in Europe: Recommendations Guide for Policy Makers", Epee, Ademe, IEE, 2009

[9]European Commission's Communication on security of energy supply and international cooperation, 2011

[10]Working towards sustainable development: Opportunities for decent work and social inclusion in a green economy, ILO, 2012

[11]European Commission's Communication COM(2008) 772 Energy efficiency: delivering the 20% target

[12]According to the European Standard EN15804

[13]Since their results can be consolidated at building level

[14]EPDs communicate the results of the LCAs

[15]Tais W. Dahl, et al., "The human impact on natural rock reserves using basalt, anorthosite, and carbonates as raw materials in insulation materials," International Geology Review, Vol. 53, No.8. July 2011, 894 - 904

[16]ECHA, European Chemical Agency: see: http://echa.europa.eu/web/guest/candidate-list-table

[17]"Tackling Fuel Poverty in Europe: Recommendations Guide for Policy Makers", Epee, Ademe, IEE, 2009

[18] "Influence of Increased Insulation Levels on Regional Air-Quality", Danish Meteorological Institute / Ecofys, 2009

[19] European Commission's Communication COM(2008) 772 Energy efficiency: delivering the 20% target

[20]"Renovation Tracks for Europe up to 2050. Building renovation in Europe: what are the choices?" Ecofys, 2012

[21] European Commission "Strategy for the sustainable competitiveness of the construction sector and its Enterprises", July 2012.

[22] Ibid

[23]"Impact on public budgets of KfW promotional programmes in the field of 'Energy-efficient building and rehabilitation'", KfW research, 2011

Mineral Wool Insulation | The most sustainable energy is saved energy!

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