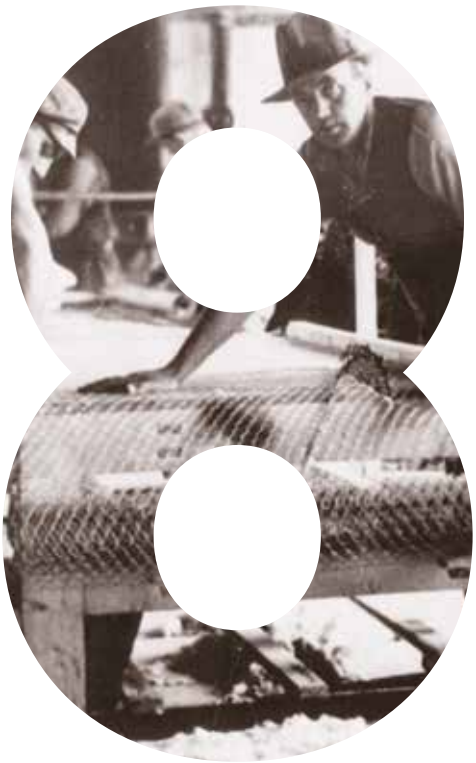
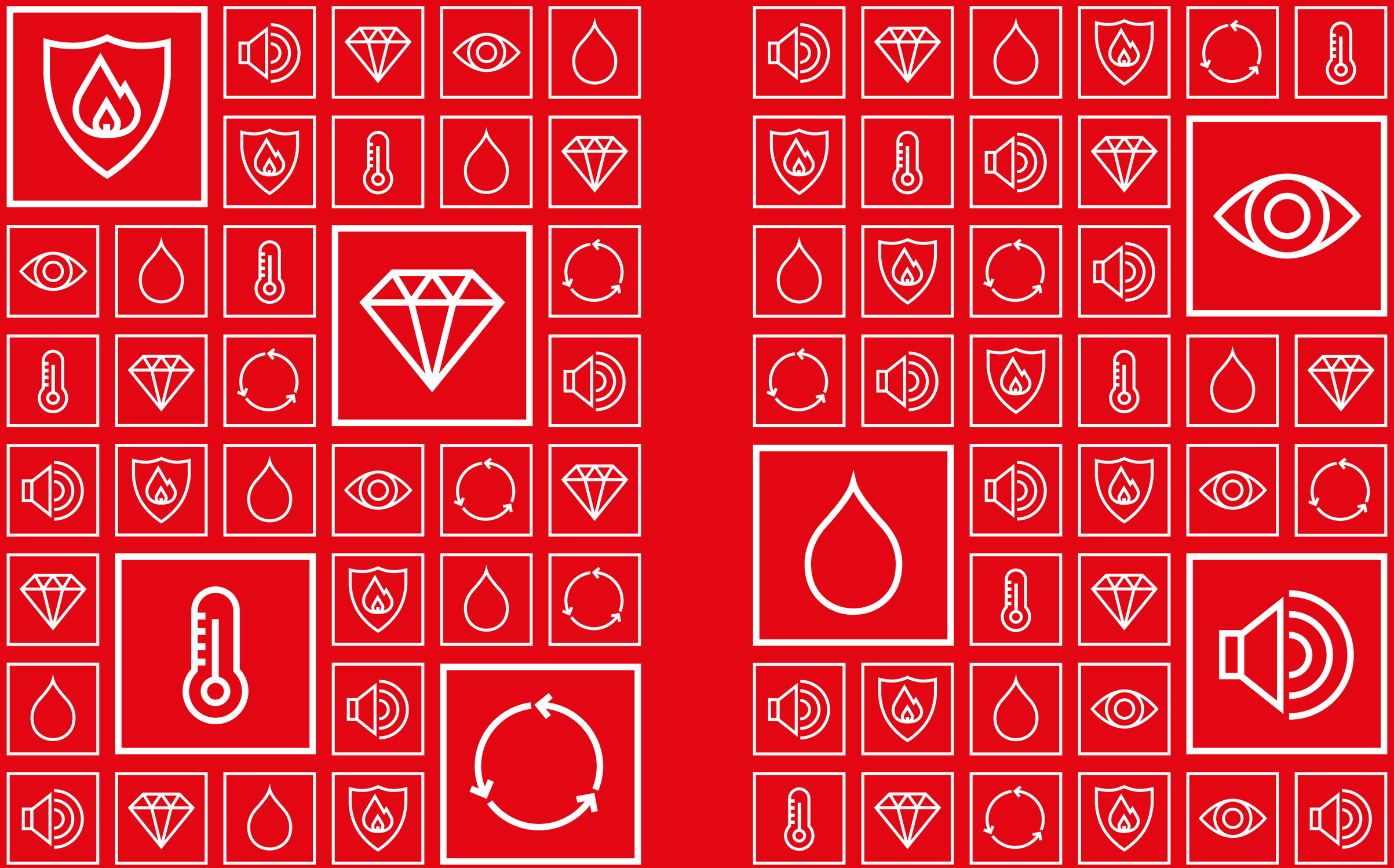


80TH ANNIVERSARY

ROCKWOOL®



Another landmark to be proud of

This book marks 80 years since the ROCKWOOL Group has started production of stone wool. We were the first to manufacture this unique material in Denmark, in 1937. Since then our products have contributed to countless landmark projects around the world.

Introduction

This year, the ROCKWOOL Group celebrates 80 years since our founders first produced stone wool in Hedehusene, Denmark, where we are still headquartered.

Continuity like this is unusual in the business world. Why has the ROCKWOOL Group endured? It's because ever since we were founded, we've had one single-minded purpose: unlocking the strengths of stone to enrich modern living.

Throughout our history, our people have been doing something that looks almost magical: transforming an abundant, renewable natural resource into materials that bring comfort, safety and sustainability to millions of people worldwide. And as we learn more and more about stone wool, we discover new ways that it can change the world for the better.

In the pages that follow, you'll see the results of this innovation in action. How low-energy living is helping combat climate change. How cities can be healthier places to live. How more food can be grown with fewer inputs. How modern buildings, no matter how dramatic their designs, can be safe, comfortable and tranquil spaces.

We hope you enjoy these stories. And at ROCKWOOL Group we are always committed to creating many more new stories as we discover different ways for the natural power of stone to address the challenges facing our world.

The 7 strengths of stone

There is something truly remarkable about the natural power of stone.

So far, we have been able to break down this natural power into 7 strengths that are inherent in the versatile properties of stone wool. And over the years we've become experts at applying these strengths to help people around the world create landmark projects and enrich modern living.

Fire-resilience

Withstand temperatures above 1000°C.

Thermal properties

Save energy by maintaining optimum indoor temperature and climate.

Acoustic capabilities

Block, absorb or enhance sounds.

Durability

Increased performance and greater stability with lower costs.

Aesthetics

Match performance with aesthetics.

Water properties

Manage our most precious resource.

Circularity

Reusable and recyclable materials.

Our history

From our first stone wool production in 1937 to the extensive range of solutions we supply today, the ROCKWOOL Group products have evolved to enhance many aspects of modern life.

1935 – Finn Henriksen, inspired by a study tour

The son of industrialist H.J. Henriksen, Finn Henriksen was inspired by stone wool production during a study tour to the USA. His visit led to the licensing of stone wool production and laid the foundation of the ROCKWOOL Group.

1935 – Stone wool production licenced

I/S Henriksen and Kähler invested USD 5,000 to acquire the licence to produce stone wool in Denmark, Norway, Sweden and Germany. At the time, the production process used steam-blown fibres to make loose wool and sewn mat products.

1937 – Stone wool production in Denmark

Production began in Hedehusene, Denmark, Skövde in Sweden and Larvik in Norway. By 1939, total production had risen to 2,000 tonnes per year in Hedehusene alone.

1939–1945 – Inspector Jørgensen, innovator

During World War II, Inspector Jørgensen kept production going with innovative substitute materials like peat briquettes, skimmed milk and paper thread.

1941 – Verner Palmquist, innovator

Working with ROCKWOOL from 1941–1985, Verner Palmquist oversaw the transition from steam-blown to spun stone wool.

1948 – Binder expands stone wool's potential

Adding binder made it possible to develop products with good dimensional stability, significantly expanding the product portfolio.

1948 – Gustav Kähler, engineer and manager

Succeeding his father as partner in 1916, Gustav Kähler played a vital role in the expansion of the business.

1952 – First use of spinning technology

Using spinners to draw fibres created higher quality stone wool.

1954–59 – Geographical expansion

ROCKWOOL established its first non-Scandinavian subsidiary in Germany. In 1958, the HQ moved from Korsør to Hedehusene and in 1959, a second factory opened in Trondheim, Norway.

1957 – ROCKWOOL engineering department founded

This five-strong team in Hedehusene aimed to build on ROCKWOOL Group's deep knowledge of core technologies.

1958 – Claus Kähler, 22 years as CEO

Becoming CEO of Henriksen & Kähler in 1958, Claus Kähler oversaw a period of significant growth in turnover and technical expertise.

1962–69 – I/S Kähler & Co founded; expansion continues

I/S Kähler & Co was founded in 1962: investments in Norway, Denmark and Switzerland followed over the next five years.

1960s – Rockfon and Grodan created

Acoustic insulation products marketed under the Rockfon brand were introduced in 1962, joined in 1969 by Grodan growing media.

1962 – The Kähler family takes sole responsibility for the ROCKWOOL business

The Kähler and Henriksen families establish two new companies, with the Kähler family taking sole responsibility for the stone wool business.

1968 – The power of partnership

Joint development with the Danish Agricultural University led to the use of stone wool in agriculture.

1970s – Always innovating

Spinrock fibres were a radical innovation, developed to replace asbestos in a wide range of materials and products.

1970s – Circular thinking

Plant workers discovered that stone wool products could be recycled, creating the foundation for a comprehensive "circularity" concept.

1970s – Demonstration projects

ROCKWOOL Group contributed to the Hjortekær low-energy test houses, which used one-tenth the energy of contemporary buildings.

1970s – ROCKWOOL International A/S founded

In 1976, ROCKWOOL International A/S was set up as a holding company for the entire Group, during a decade that saw the business develop and expand significantly. Investments were made in the Netherlands, subsidiaries Grodania and Rockfon were set up and ROCKWOOL Limited was established in the UK.

1978 – Tom Kähler: the next generation takes over

Tom Kähler was employed as Director for emerging enterprises in 1978 and in 1987 became CEO, a position he held until 2004.

1980s – Expansion through Europe and North America

This decade saw expansion into France, Germany, Austria, Spain. Growth in Canada and the US led to ROXUL becoming North America's largest stone wool producer.

1980s – New generation of stone wool fibres

In 1982, fibres with even higher temperature stability were created, forming the basis for today's high-temperature, bio-soluble stone wool.

1980s – Rockform moulded components

Learnings from Rockform tailor-made moulded components marketed during this decade helped develop many of today's ROCKWOOL Group products.

1981 – The ROCKWOOL Foundation

The ROCKWOOL Foundation was established to generate knowledge that can help tackle problems facing society today. It achieves this through impartial scientific research into social and economic issues, and by carrying out practical interventions. The Foundation's work is particularly focused on issues related to the sustainability of the welfare society.

1985 – Driving innovation

This decade saw the development of fire-protection products Conlit and Rocklit and the beginnings of Lapinus water management solutions.

1987 – Tom Kähler becomes CEO

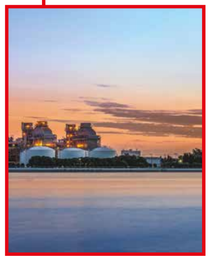
In 1987, Tom Kähler was appointed CEO, cementing ROCKWOOL's role as a global player in the insulation business during his 17-year tenure.

1992 – Focus on energy efficiency

The 1992 Earth Summit created awareness of how insulation can contribute to significant reductions in CO_2 emissions.

1992 – Strategic focus on technology and R&D leadership

A new HQ Group Technology function solidified the foundation for ROCKWOOL's strong global leadership in stone wool.



1999 – Expansion eastward and beyond

The 1990s saw expansion through Russia, Poland, Hungary and the Czech Republic, with further production added in Canada, Italy and France. In 1997, Rockdelta was established, offering solutions for vibration and noise control.

2000 – Spreading further abroad

In 2000, a factory in Malacca, Malaysia was acquired and a greenfield factory in Spain taken into operation. ROCKWOOL Group added new manufacturing capacity in Russia, Hungary, Croatia and Poland and in 2008, the decision was taken to build a new factory in Gujarat, India.

2001 – Health and safety of ROCKWOOL products confirmed

In 2001, the International Agency for Research on Cancer classified rock (stone) wool insulation as Group 3: not classifiable carcinogenic in humans.

2010 – Growth in Russia and America

From 2010 on, the Group added further manufacturing facilities in Russia and the US, through both acquisition and greenfield sites.

2015 – A new CEO arrives

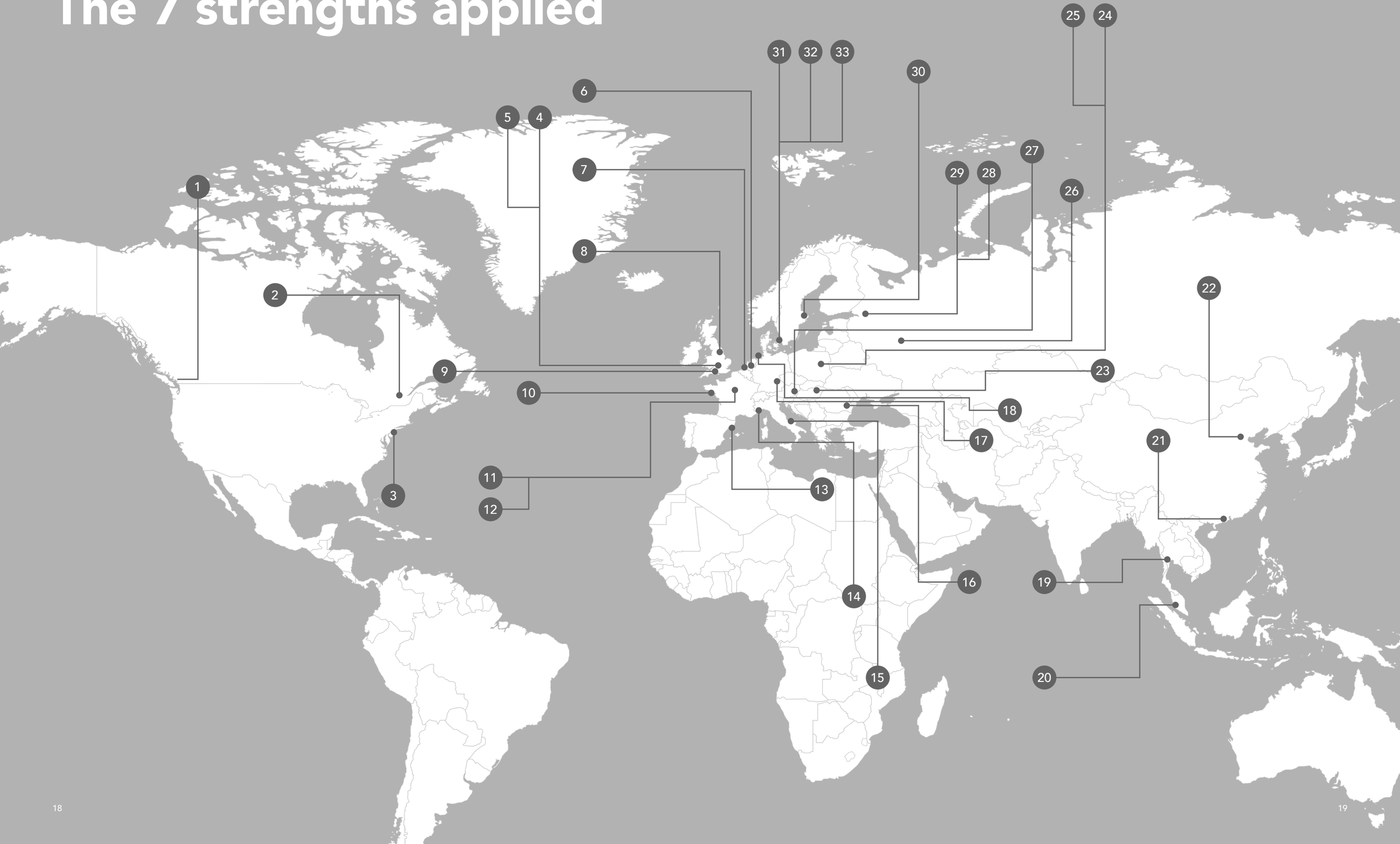
The appointment of Jens Birgersson as CEO of the ROCKWOOL Group marked a renewed focus on business efficiency, including the subsequent launch of wide-ranging business transformation programme.

Claus Kähler and family

"Our recent strong achievements are also founded on these same attributes that were developed over forty years ago."

Tom Kähler, son of Claus Kähler and former CEO of the ROCKWOOL Group

The 7 strengths applied



Landmarks we are proud to be part of

1 Guildford Aquatic Centre, Surrey, Canada (2015)

2 Cogeco Amphitheatre, Trois-Rivières, Canada (2016)

3 Cornell Tech, New York, USA (2017)

4 Shakespeare's Globe Theatre, London, UK (1994)

5 Olympic Stadium, London, UK, (2014)

6 Water management, Schimmert, Netherlands (2017)

7 Port House, Antwerp, Belgium (2016)

8 Think Tank, Lincoln, UK (2008)

9 Wilmcote House, Portsmouth, UK (2014)

10 Harmony of the Seas, Saint-Nazaire, France (2012)

11 Philharmonie de Paris, Paris, France (2015)

12 Hexagone Balard, Paris, France (2015)

13 Agbar Tower, Barcelona, Spain (2005)

14 Biosphera 2.0 (Various), Italy (2016)

15 Family House, Cherasco, Italy (2005)

16 The Landmark, Bucharest, Romania (2015)

17 Elementary School, Plößberg, Germany (2016)

18 HVDC DolWin2, Germany (2014)

19 MahaNakhon, Bangkok, Thailand (2016)

20 Petronas Towers, Kuala Lumpur, Malaysia (1996)

21 Wangjing SOHO, Beijing, China (2014)

22 Hong Kong Airport, Hong Kong, China (1998)

23 Apollo Tyres Factory, Gyöngyöshalász, Hungary (2016)

24 Kazmierczak family, Poland (2016)

25 Koszyki Hall, Warsaw, Poland (2016)

26 Ostankino Tower, Moscow, Russia (2015)

27 Skuta alpine hut, Slovenia

28 State Hermitage, St Petersburg, Russia (2013)

29 Pulkovo Airport, St Petersburg, Russia (2014)

30 Stockholm metro, Sweden (2016)

31 Novo Nordisk corporate headquarters, Copenhagen, Denmark, (2013)

32 Amalienborg, Copenhagen, Denmark (2004)

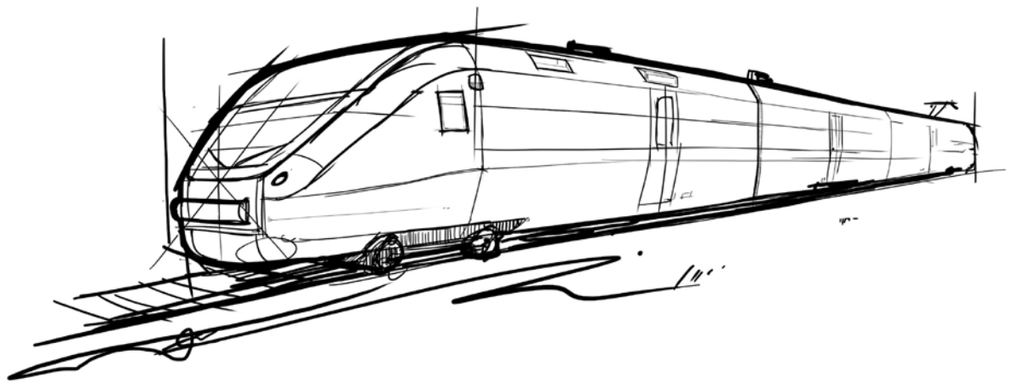
33 Sydhavn Skole/South Harbour, Copenhagen, Denmark (2017)

34 Amager Bakke/Copenhill, Copenhagen, Denmark (2017)

An insight from Jens Birgersson

“The silent, often-hidden existence of our products makes our lives measurably more comfortable and enjoyable.”

CEO of the ROCKWOOL Group



When I joined the ROCKWOOL Group, I knew I was joining a unique organisation.

Researching the company before I took the job, I was struck by how the Group’s products are becoming more important today. In an age where game-changing technology can swoop in and turn an industry on its head, there was something very reassuring in seeing that the ROCKWOOL Group’s role in society was not easily replaced – even after many decades it was more important than ever.

It’s not only that our products can help meet environmental targets by improving the energy performance of buildings. At a time when better waste management is urgently needed, their infinite recyclability can also be part of making the ‘circular economy’ a reality. And in an era when we spend up to 90 percent of our time in buildings, our products help create the comfortable, safe and healthy indoor environments on which our wellbeing depends.

The beauty of our products is that they are all around us, all the time, no matter where we are. In a recent durability test, we found out that 55 years after they were installed, our products performed as well as they did at the start. Our 80th anniversary is a perfect occasion to remind all our stakeholders that while our products are quiet and usually go unnoticed, their silent, often-hidden existence can make our lives measurably more comfortable and enjoyable for many years to come. This story comes to life in the many landmarks around the world that are built using ROCKWOOL products.

Pool of tranquillity

A light-filled interior with gentle acoustics makes this aquatic centre a great place to relax, train or compete

Guildford Aquatic Centre, British Columbia, Canada 2015

Indoor swimming pools can be noisy environments. Often located in big spaces, they can have unpleasant acoustics as sound reflects off hard surfaces, and many have harsh artificial lighting too. Humidity of up to 100 percent can also be a problem if not properly controlled.

So creating a comfortable pool demands close attention to detail and a careful choice of materials. When Bing Thom Architects designed the Guildford Aquatic centre in Surrey, British Columbia, their aim was to create a world-class facility with an inviting environment to match its innovative, modern aesthetic. Carefully placed glazing maximises the impact of sunlight, while specially selected materials provide reflective surfaces, spreading light throughout the interior. However, the secret behind the ambience is in the sound-absorbing ceiling panels which control the noise to pleasant levels.

ROCKWOOL stone wool products are integral to this bright, attractive facility. Rockfon Sonar® X and Rockfon Sonar® Activity ceiling tiles control sound and reflect light, while also helping manage humidity. And because stone wool is unaffected by mould growth, it helps maintain a healthy environment within the building.

"Although Rockfon's products were new to us in North America, we reviewed its proven history and precedents on other pool projects in Europe. Rockfon's ceiling panels met the project's acoustic, light reflectance and atmospheric requirements, as well as the economic ones."

Brian Woudstra, business development engineer at contractors StructureCraft

Perfect performances every time

Careful acoustic design and tough materials help audiences enjoy great sound quality at this outdoor venue

Cogeco Amphitheatre, Trois-Rivières, Quebec 2016

Located on the site of a demolished paper mill at the confluence of Saint-Laurence and Saint-Maurice rivers, the Cogeco Amphitheatre has become a signature building for the Trois-Rivières area. This imposing structure features a 25 metre-high roof and includes seating for 3,500 people and space for a further 5,500 on a sloped lawn.

As for any open-air performance venue, close attention to acoustics is essential to ensure that sound carries properly without causing echoes or getting lost in the air. So acoustic consultants Octave chose a blend of materials to ensure that sound was absorbed and reflected in the right places. The roof's underside is built with perforated custom steel panels on top of 50mm of ROCKBOARD® 80 acoustic stone wool insulation, with lower-density AFB® insulation used toward the back of the stage.

ROCKWOOL stone wool's properties are ideal for this venue, where temperatures can range from -30°C to 30°C and humidity stays high because of the nearby rivers. Stone wool resists moisture, absorbs unwanted noises and echoes easily and helps keeps interior spaces at comfortable temperatures. Stone wool retains these properties whatever the weather, ensuring that performances are always of a consistent quality. And as a non-combustible material it contributes to fire safety at the amphitheatre too. Audiences in Quebec now have a sophisticated outdoor performance venue that can play host to the largest local, national and international productions.

Stone wool retains its properties whatever the weather, ensuring that performances are always of a consistent quality.

High-rise energy saving

The world's largest, tallest Passive House building is helping New York City meet aggressive CO_2 targets

The House at Cornell Tech, New York, NY, 2017

New York City has set itself some ambitious environmental goals. It's aiming for a 50 percent cut in lower Manhattan's CO_2 emissions by 2030, and a city-wide 80 percent reduction by 2050. In a densely-packed metropolis where the built environment creates 70–75 percent of greenhouse gas emissions, nearly all generated by heating and cooling systems, better buildings are the solution.

The House at Cornell Tech is showing what's possible. Standing tall at 26 storeys, this residential facility for students, staff and faculty is the largest and highest building ever built to the demanding Passive House standard. This approach to building, which was pioneered in Germany, maximises the use of passive measures (or solutions) to reduce the energy need using insulation in the design of the building. Strict limits on energy use for heating, cooling and thermal comfort are applied as a criteria, in order to place the focus on efficiency first.

High quality insulation is central to passive construction, creating an optimal indoor climate by minimising the need for active heating and cooling. In The House, architects exclusively used ROCKWOOL stone wool products. A 280mm thickness of CAVITYROCK® semi-rigid insulation boards as well as AFB® and ROCKBOARD® are used to wrap the building in an insulated blanket. And as well as helping The House meet the Passive House standard, non-combustible stone wool provides the acoustic insulation and fire safety that's essential in multi-storey residential buildings.

It's estimated that The House will save 882 tonnes of CO_2 emissions per year – the equivalent of planting 5,300 new trees – helping New York City in its quest to lighten its environmental footprint.

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Risen from the ashes

How to build a 16th century theatre with 20th century fire resilience

Shakespeare's Globe Theatre, London, 1994

Few buildings could have been more of a fire risk than London's original Globe theatre. Built from timber in 1599, it was destroyed by fire fourteen years later when a stage cannon set light to its thatched roof. The Globe took just two hours to burn to the ground. It was quickly rebuilt, this time with a tiled roof, but then demolished to make way for housing under a Puritan administration that disapproved of theatre.

Fast-forward over 300 years, and American actor, director and producer Sam Wanamaker began a campaign to re-build the original Globe. In 1994, his vision was realised with the faithful period reconstruction that graces the south bank of the river Thames today.

In rebuilding the original theatre, the builders faced a dilemma: how to make such an inherently flammable building safe for theatregoers, while respecting very strict fire regulations?

The architects selected ROCKWOOL non-combustible stone wool boards to be at the heart of their fire safety strategy. In the roof, the rigid, foil-faced Conlit 150 boards were laid across the oak rafters and laths, preventing fire penetration from within and outside the structure. No longer would the thatched roof present such a fire risk. The same product was also used to provide a fire-protective core for the Globe's walls, where they are concealed within traditional lath and plaster construction.

This way, modern fire protection is "built in" to the Globe's traditional fabric. The reborn theatre can keep its authentic period appearance yet at the same time ensure theatregoers can feel much safer than their 16th-century predecessors.

With ROCKWOOL non-combustible stone wool boards, fire protection is 'built in' to the building's fabric.

Hear every cheer

To make sure no one misses a moment of the action in the London Olympic stadium, we helped a roof to retain sound

Olympic Park Stadium,
London, 2014

In any stadium, acoustic performance is critical to the experience of athletes and spectators. And in an urban context, it's also essential to making sure audiences can enjoy themselves without disturbing the peace of the neighbourhood. In the high-profile renovation of the UK Olympic Park Stadium, stone wool provided the perfect answer. It helped the new roof retain sound within the stadium to create an unforgettable experience for athletes and spectators – without affecting the surrounding environment. As well as improving acoustic performance, stone wool is naturally fire-resistant, helping to keep many thousands of visitors safe every year.

As well as improving acoustic performance, stone wool is naturally fire-resistant, helping to keep many thousands of visitors safe every year.

An insight from Henrik Brandt

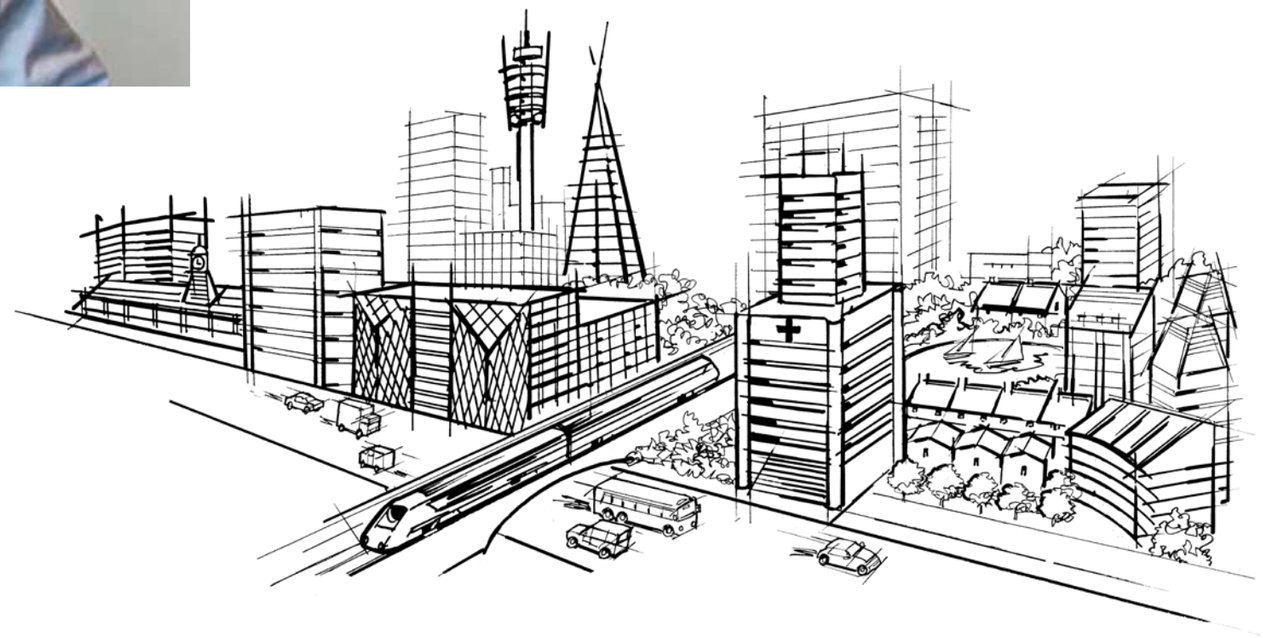
Chairman of the Board of Directors

The challenges of the future are the ROCKWOOL Group's opportunities of today.

When energy consumption is expected to rise 50 percent by 2050, we can help buildings – which are major energy consumers – to achieve savings of up to 90 percent. And when urban populations are expected to need 50 percent more food and 17 percent more water by 2050, our products can help conserve water and make food production more resource-efficient.

Whether it's a question of meeting new energy efficiency regulations, renovating buildings, ensuring food security or creating safer and more resilient cities, we can enrich modern living in a sustainable way. Over the years, thanks to the loyalty of our customers, we have contributed to many iconic projects across the globe. They stand as a testament to the attitude that makes us different: we strive to improve people's lives wherever they are, in a manner that is respectful to the surrounding environment. We are in the game for the long-term: these first 80 years are just a foretaste of what is to come.

"The challenges of the future are the ROCKWOOL Group's opportunities of today"



How to stop heavy rain becoming a flood

A world-first water management solution is helping protect the people of Schimmert in the Netherlands from annual flooding

Water Management, Schimmert Netherlands, 2017

Increasingly, people living in the small village of Schimmert face heavy downpours each year that lead to serious flooding. Because the sewer system cannot drain away the volume of water from this extreme rainfall quickly enough, roads, houses and garages are inundated. This is unpleasant, unhygienic and expensive for the village and its residents.

In a world-first project, we used the water-absorbent properties of stone wool to create and install a water management system underneath the playground of a local school. Using around 550m^3 of Lapinus water management solutions, it's the first ever project on this scale. The specially designed stone wool slabs can absorb up to 95 percent of their own volume in water, so they act as a buffer for extreme rainfall, collecting it and then gradually releasing the water into the sewer at a rate the system can cope with. Within 24 hours, the buffer – big enough to manage a "once in a hundred years" rainfall event – is ready to take on the next big downpour.

With a long service life, this stone wool solution will help protect Schimmert's people and their property from extreme weather for many years to come.

Specially designed stone wool slabs can absorb up to 95 percent of their own volume in water, so they act as a buffer for extreme rainfall.

Futuristic and future-proof

Sustainability was a key target for the Port of Antwerp's striking new headquarters

Havenhuis/Port House, Antwerp, Belgium 2016

Each year, 26 percent of Europe's container shipping passes through Antwerp in Belgium, Europe's second-largest port and a direct employer of over 60,000 people. When the port needed to expand its head office, its priority was to create a sustainable and future-proof workplace that reflected its values.

The remarkable new Zaha Hadid-designed building, perched atop a former fire station on the quayside, is a major architectural statement that also features a range of technologies designed to reduce its impact on the environment. An innovative borehole system for water heating and cooling, lighting controls and high-quality insulation have all contributed to the Port House's "Very Good" BREEAM environmental rating.

ROCKWOOL stone wool was used primarily for its acoustic properties, protecting against noise from technical installations on the flat roof, and for fire protection, insulating steel construction in the new building. The ROCKWOOL Conlit Steelprotect board used in the building meets the highest A1 Fire Class rating. And with our "cut to fall" service, the roof insulation was precisely custom-shaped, so it could be installed quickly on the complicated boat-shaped surface while still ensuring the roof drained properly.

By protecting employees and contributing to the Port House's longevity, ROCKWOOL stone wool insulation is helping ensure this radical new building lasts long into the future it symbolises.

"The excellent acoustic performance of ROCKWOOL stone wool is an important advantage, because the many technical installations on the roof can cause quite some noise", says Engineer Architect Gert Biebauw, project leader at Bureau Bouwtechniek. "The cut-to-fall slabs made it possible for us to create the right angle for directing rain water away from the roof. The highly detailed cut-to-fall plan designed by ROCKWOOL helped us a great deal."

"The excellent acoustic performance of ROCKWOOL stone wool is an important advantage, because the many technical installations on the roof can cause quite some noise."

Gert Biebauw, project leader at Bureau Bouwtechniek

Different from every angle

Rockpanel® cladding adds an extra dimension to this innovative building

Think Tank, Lincoln, UK, 2008,

This award-winning building embodies its purpose. Designed with sustainability in mind, Lincoln's Think Tank innovation centre – a business incubator with offices, workshops and communal areas – used the latest materials and techniques to blend excellent environmental performance with cutting-edge aesthetics. The design harks back to history, too: the centre's shape, colours and angles recall the first WW1 tanks, which were built and tested nearby.

Most striking for visitors to Think Tank, though, is the building's colour, which shifts from shades of deep green through to bronze and orange depending on the light conditions and the angle you view it from. This effect is made possible by Rockpanel Chameleon®, a special grade of compressed stone wool cladding with a crystal top layer that refracts light, and appears to change colour as you move around it.

Chosen as a cost-effective alternative to fibre cement boards, Rockpanel cladding supports the architect's sustainability goals as well as meeting the highest fire safety standards. It's long lasting, 100 percent recyclable and made from a renewable natural resource, basalt rock. And in the case of the Think Tank, the cladding's colour creates a subtle connection to the area's manufacturing past, as architect Julia Marks points out: "The tank reference is not meant to be visible to every visitor, but I like buildings that echo their surroundings."

Together with the Think Tank's green roof, highly insulated envelope and ground-source heating system, Rockpanel cladding has helped create a building that will have a positive impact on the future.

"The tank reference is not meant to be visible to every visitor, but I like buildings that echo their surroundings."

Julia Marks, Architect, Architects Marks Barfield

Fighting fuel poverty

"This insulation will make an appreciable difference to this issue. Significantly reducing heat loss through the thermal envelope by insulating the building wall alongside other works will help the project meet the EnerPHit standards."

James Traynor, ECD Architects

Energy renovation aims to make comfortable living affordable for social housing residents

Wilmcote House, Portsmouth, UK, 2014

Portsmouth's 100-home Wilmcote House development was built at a time when energy performance was less of a priority than it is today. Constructed in 1968 from prefabricated concrete panels that had just 25mm of insulation, it also featured electric heating that makes it very costly for residents to stay warm indoors. As a result, many residents are unable to afford to heat their homes adequately. This is a serious issue in Europe, where 10.8 percent of people cannot afford to keep their homes warm. Countries with the worst-performing housing have higher winter mortality rates, in both warm and cold climates. In Europe, over 80 million people also live in damp homes, which can cause respiratory illnesses.

At Wilmcote House, although residents liked their flats and their location, poor energy performance was a major issue. It led to high heating bills and mould, damp and condensation which can adversely affect health. Recognising that poor insulation was the main problem, the City Council embarked on a major energy efficiency upgrade aimed at meeting the EnerPHit standard, which for renovations is the equivalent of the Passive House low-energy building standard. The aim was to reduce heating demand by 90 percent and extend the building's life by 30 years.

"Most of the residents are suffering from serious fuel poverty," says James Traynor of ECD Architects. "This insulation will make an appreciable difference to this issue. Significantly reducing heat loss through the thermal envelope by insulating the building wall alongside other works will help the project meet the EnerPHit standards."

The "deep retrofit" project involved different insulation measures, with ROCKWOOL REDArt® providing external wall insulation, Rockpanel® used for cladding and a selection of our fire protection products included for fire safety. The result will not only help take residents out of fuel poverty – it will also make Wilmcote House a more pleasant place to live. As James Traynor of lead designers ECD Architects says: "The project will improve conditions within all properties, making them feel much warmer and substantially reducing fuel bills."

Fire safety ahoy

ROCKWOOL products are at the core of this giant cruise ship's structure, providing fire protection, and acoustic and thermal comfort for everyone on board

Harmony of the Seas,
Saint-Nazaire, France, 2012

It's like a floating city. Harmony of the Seas, the largest cruise ship ever built, can carry 5,479 guests plus crew and staff, all of whom want to feel safe and comfortable throughout the voyage. Chosen as the insulation supplier for this huge project, we provided insulation for everything from the core structure of the ship to cabin ceilings and walls.

The 1,800 tonnes of ROCKWOOL SeaRox products fitted to Harmony of the Seas makes the ship safer and more comfortable for guests and crew. Protected by non-combustible insulation, guests and crew can feel confident of the ship's fire safety performance during their time at sea.

And because there are so many different activities on board a cruise ship – Harmony of the Seas boasts a theatre and an ice rink, for example – good sound insulation is essential. SeaRox insulation's acoustic properties help to ensure that everyone can enjoy their holiday the way they want it, without disturbance. Guests and crew will be comfortable, too, as SeaRox helps to keep the ship's interior at a pleasant temperature regardless of the weather outside.

The insulation's thermal properties and recyclability also help owner Royal Caribbean to reduce its environmental impact: Harmony of the Seas is 20 percent more energy efficient than comparable vessels.

"Our products are used throughout the ship. The fire safe qualities of the insulation make the ship a safer place for crew members and guests, while the acoustic and thermal benefits create a more comfortable and relaxing environment."

Daniela Ferrari, Sales manager RW-TI

The sound of tomorrow

Stone wool insulation helps audiences to hear performances in uninterrupted clarity, in a building that is unlike any other.

State-of-the art architecture and acoustic design create a new musical experience for Parisian concertgoers

Philharmonie de Paris, France, 2015

Although it may host performances of music composed centuries ago, the Philharmonie de Paris offers an ultra-modern environment for its audiences. This radical building, which was completed in 2015 and designed by architect Jean Nouvel, has been likened to a giant spaceship with its patterned aluminium cladding and extreme angles.

Inside the main auditorium, though, softer and more organic forms predominate. The main concert space is designed to create perfect acoustic conditions and foster a sense of intimacy between the performers and up to 2,400 concertgoers.

Achieving these 21st-century levels of performance while keeping audiences comfortable and safe in such an extraordinary building depends on the latest in insulation technology. The builders of the Philharmonie de Paris chose ROCKWOOL insulation to support the new building's acoustic and fire safety performance. ROCKACIER C® insulates the roofs while DB Rock® provides sound insulation within the walls. Stone wool's flexibility is perfectly suited to fit the unusual shapes and angles in the Philharmonie de Paris, and once installed, it prevent outside noise from interfering with the audience's listening experience.

Stone wool insulation helps audiences to hear performances in uninterrupted clarity, in a building that is unlike any other.

Security designed in

Fire protection and safety are key priorities in France's extraordinary new Ministry of Defence

Hexagone Balard, Paris, France, 2015

The Hexagone Balard, the new Paris HQ for the French military, is a building of superlatives.

It's built over a sprawling 41-acre site, designed to accommodate over 9,000 personnel. At its core is a hexagonal structure that reflects the shape of France.

Safety and security are integrated into the design of this massive, high-tech structure, which acts as the command-and-control centre for France's army, navy and air force. Fire protection is bolstered by 16,000 m^2 of 150mm ROCKFEU® non-combustible insulation. Providing a superior fire rating, which can provide as much as two hours' additional protection in the event of a fire in a large building, is crucial as it gives people time to evacuate a building. Over 50,000 m^2 of ROCKFACADE® insulated cladding offers even further protection, while enhancing the building's appearance.

Stone wool insulation also contributes to another fundamental feature of the Hexagone Balard: energy efficiency. With its 4,000m^2 solar roof, ground-source heat system and in particular the passive design features achieved through insulation and insulated cladding, the building has been designed to be almost self-sufficient in its use of natural resources, an extraordinary feat for a project on this scale.

"The combination of ROCKFACADE and ROCKFEU met the high requirements by improving fire protection and durability in the building, while the environmental benefits of ROCKWOOL products also played a key role."

Jean-Francois Dumand of the Law Energy Design Department, ROCKWOOL France

"Stone wool insulation improves the comfort and habitability of the building more reliably and with better sustainability than alternatives, reducing its environmental impact over time."

Fermin Vazquez, Architect

Sustainability for a striking landmark

Barcelona's extraordinary Torre Agbar uses ROCKWOOL stone wool to reduce its environmental impact

Agbar Tower, Barcelona 2005

Completed in 2003 and inspired by the Montserrat Mountains and Gaudi's Sagrada Familia, the Agbar Tower has rapidly achieved icon status in Barcelona for its eye-catching appearance. The building's multi-coloured, aluminium-clad structure reflects light during the day, and at night, the tower can be lit up with thousands of built-in LEDs.

The building's first owners were water company Grup Agbar and the tower has been built with a strong focus on sustainability, using "bioclimatic" design that adapts to the environment. Windows and blinds maximise natural ventilation and use sunlight to reduce energy costs, and the designers sought out materials with a low environmental impact.

ROCKWOOL stone wool insulation was selected as the best choice of insulation for the tower, because of its environmental, aesthetic and technical qualities. According to architect Fermin Vazquez, the insulation "improves the comfort and habitability of the building more reliably and with better sustainability than alternatives, reducing its environmental impact over time."

Approximately 40,000 m^2 of 40mm-thick ROCKWOOL stone wool was used beneath Torre Agbar's aluminium facade, where it protects occupants against excessive heat, noise, humidity and fire risk. Fire safety is fundamental in high-rise buildings, making non-combustible stone wool an ideal choice. The insulation can also be shaped easily to create an insulated envelope for curved and irregular structures, so at Torre Agbar it forms part of a breathable outer skin that helps the building to be comfortable, safe and energy efficient. And because of ROCKWOOL stone wool's excellent durability, the occupants of Torre Agbar will enjoy these benefits for many years to come.

Zero-energy living, anywhere

An autonomous housing experiment is made possible by ROCKWOOL materials

Biosphera 2.0,
Italy, 2016

Biosphera 2.0 is the outcome of an ambitious university competition to design a living space that will allow people to live comfortably in all extremes of climate while needing no energy at all. The 25m^2 module includes all necessary services – from lighting and cooking amenities to heating and cooling – and its design guarantees interior temperatures of no more than 25°C in summer and no less than 21°C in winter.

To test its performance and explore people's reactions to living in it, Biosphera 2.0 is being transported around Italy, where it will experience a wide range of climates: extreme cold in the alps; summer heat in the lowlands; and wet and dry conditions.

ROCKWOOL Italia has been a technical partner for Biosphera 2.0, working with the student team and architects to help them realise the project's ambitions. We provided the insulation system for the facades, which created a healthy indoor environment and added a particularly striking aesthetic effect, and our thermal insulation panels were used for module's roof.

Loredana Lualè, a project sales specialist at ROCKWOOL Italia, lived in Biosphera 2.0 for two days: "It has been a really enriching experience at a personal and professional level. Living and sleeping in the module, I could feel at first hand the excellent level of internal comfort and could see a better, different way of living. And the best point is that it is so easy to achieve!"

By helping to create a perfect indoor climate, whatever the weather, ROCKWOOL products are helping tomorrow's architects create sustainable living solutions for the future.

"It has been a really enriching experience at a personal and professional level. Living and sleeping in the module, I could feel at first hand the excellent level of internal comfort and could see a better, different way of living. And the best point is that it is so easy to achieve!"

Loredana Lualè, project sales specialist, ROCKWOOL Italia

The house that works with the weather

ROCKWOOL insulation is at the core of this ground-breaking Passive House renovation

Family house, Cherasco, Italy, 2005

Everyone wants a home that last forever. But today, sustainability has a more profound meaning. In housebuilding, it means not just long life, but also a home that makes minimal demands on the environment while creating a comfortable, safe space for a family to live in.

Originally developed in Germany, the "Passive House" standard is one of the leading techniques for achieving this. It uses the "passive" influences in a building – like sunshine, shading and ventilation – together with high levels of insulation and airtightness to achieve a pleasant interior environment that uses up to 90 percent less energy than a traditional building.

Owner and architect Maria Grazia Novo was motivated by "the desire to change and improve the family home". The house she chose for her family dated back hundreds of years and needed to be totally renovated while staying in harmony with local building traditions. A concern for environmental impact (and the lack of mains gas for heating) led the architect to opt for a passive house build. In doing so, Maria became a pioneer, creating, in 2005, one of the first such projects in a Mediterranean climate.

Insulation is central to the passive approach, which aims to reduce the energy needed for heating and cooling to an absolute minimum. ROCKWOOL materials are perfect for sustainable standards like passive house because they offer excellent thermal insulation, are vapour-permeable and have a long lifespan. And because ROCKWOOL insulation can be easily fitted within a house's roofs and walls, it has no impact on the building's appearance.

Commenting on the partnership with the ROCKWOOL Group, Maria Grazia Novo said: "This was an ambitious project of a type that had not been attempted before, so we needed the cooperation of a leading company in the insulation sector. ROCKWOOL Group was the innovative partner we needed, with the sensibility and foresight to embrace this project."

With the help of stone wool insulation, an old building can keep its traditional appearance but with 21st-century levels of energy performance and comfort, creating the perfect sustainable family home.

"The ROCKWOOL Group was the innovative partner we needed, with the sensibility and foresight to embrace this project."

Maria Grazia Novo, Architect

An insight from Panita Saengchan

Country Sales Manager

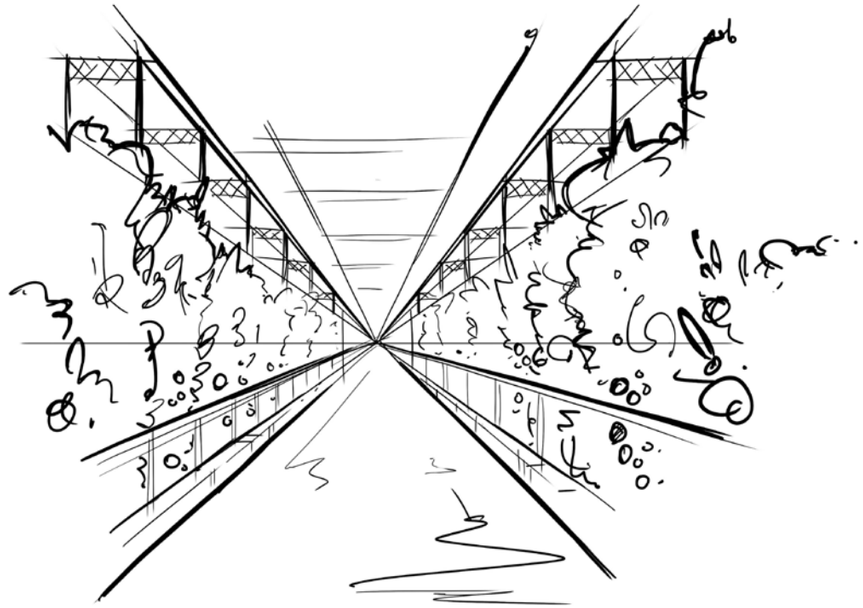
For me, it's obvious why anyone would want to work here.

Our products have made a positive difference to society and the environment for the past 80 years – when sustainability was not even on the radar of large corporations – and that is something to be proud of. The company's philosophy throughout its history has been to always act responsibly, which gives employees a sense of trust and confidence.

ROCKWOOL Group's management philosophy is about giving people responsibility and empowering them to get things done, always with a clear purpose in mind: to enrich the life of our business partners, customers and end users. The door is open to opportunities if you want them.

It's great to feel that I'm actively contributing – together with our customers – to delivering new, more sustainable solutions for energy efficiency in buildings and creating better and more comfortable environments for the people who use them. And it's good to know that my work will provide lasting benefits in landmark structures for years to come.

"The company's philosophy throughout its history has been to always act responsibly, which gives employees a sense of trust and confidence."



Modern workplace in a historic district

"In this project we have managed to create a very well balanced environment that enriches the architecture of the central business district and creates a very pleasant internal and external ambience."

Constantin Banu, General Manager, Alecsandri Estates

Efficient insulation creates a perfect office climate in the heart of Bucharest

The Landmark, Bucharest, Romania, 2015

To attract the best companies, today's office buildings need to combine an attractive location with the highest standards of comfort and safety. And when sustainability is high on many business priority lists, good environmental performance is becoming more and more important.

Innovative insulation has helped Bucharest's new Landmark development to offer its corporate tenants the best of all worlds. It means that an office in a historically preserved central area of Romania's capital can provide employees with a comfortable, quiet and fire-safe working environment, while helping reduce the environmental impact of the company they work for.

The Landmark's builders chose ROCKWOOL dual density insulation for the ventilated facade, providing thermal comfort throughout the year despite Bucharest's hot summers and cold winters. This also reduces the need for air conditioning, meaning lower energy bills for tenants. ROCKWOOL insulation was used throughout the ceilings and walls of the Landmark's three-level underground car park, to regulate the temperature and protect against noise and fire. The building has now achieved a BREEAM "Very Good" rating.

Stone wool insulation has helped the Landmark's creators to realise their ambition of creating an attractive, high-end office development. As Constantin Banu, General Manager of investor Alecsandri Estates, confirms: "We were extremely exacting with regards to the quality of the materials equipment used in our building and this is why we chose a partnership with the ROCKWOOL Group. In this project we have managed to create a very well balanced environment that enriches the architecture of the central business district and creates a very pleasant internal and external ambience."

Space to learn

Stone wool insulation creates a safe and peaceful indoor environment for schoolchildren and their teachers

Plößberg Elementary School, Bavaria, Germany, 2016

Schools are the engine of every community, developing and taking care of tomorrow's talented citizens. So it's particularly important that school buildings provide an environment that's conducive to learning, safe, and resilient. When renovation work at this elementary school in southern Germany was carried out in 2016, the architects focused on creating ideal acoustic conditions within the classrooms, as well as achieving high safety and energy performance standards.

The school was fitted with state-of-the-art stone wool facade insulation that combines fire and thermal protection with high levels of sound insulation. Acoustics are important to learning: too much noise has been shown to hamper children's memory performance and even delay their reading development: research has shown that students cannot hear up to 70 percent of consonants spoken by teachers. At the same time, teachers' voices can suffer if they have to shout to be heard. The insulation at Plößberg Elementary school shields schoolchildren from unwanted noise, while at the same time protecting them from fire hazards. The ROCKWOOL HECK® systems used are certified to Germany's exacting Blue Angel standard, which was created by the federal government to combat climate change and protect people and the environment.

School principal Irmgard Wittmann appreciates the peace of mind and learning environment that the school is able to provide: "Knowing that a sustainable, non-combustible Blue Angel-certified insulation system protects our facade feels good and safe. Indoor climate and acoustics have significantly improved. Such a comfortable environment for learning and studying provides our 122 students between the ages of six and ten with the ideal conditions for their personal development."

"Knowing that a sustainable, non-combustible Blue Angel-certified insulation system protects our facade feels good and safe. Indoor climate and acoustics have significantly improved."

Irmgard Wittmann, School Principal

Securing the future of energy

Stone wool helps ensure that offshore wind power is safely delivered to where it's needed

HVDC DolWin2,
North Sea, 2014

Offshore wind farms in northern Europe have huge potential for generating renewable, low-carbon electricity. For example, just one operator, Germany's TenneT, is investing up to €9 billion over the next 10 years to create 7 GW of connection capacity – enough to power 9 million households. It expects to be half way to this target by 2023.

One of the challenges for wind energy operators and utilities is how to bring the energy ashore. HVDC (high voltage direct current) technology is a more efficient way to transport the AC (alternating current) power generated by wind turbines. This means converting the current as close as possible to where it's generated. When wind farms are far offshore, it makes sense for the converter station to be out at sea too.

HVDC DolWin2 is the world's most powerful offshore converter, designed to connect the Nordsee One, Gode Wind I and Gode Wind II windfarms, which are 45-60km off the German coast. With capacity of 916MW, enough to power 1 million households, it will transfer clean power with minimal losses to an onshore converter that connects to the electricity grid.

Fire protection is of great importance in such a critical piece of infrastructure, especially when it's out at sea and often difficult to reach because of challenging weather conditions. By slowing down the spread of fire, stone wool insulation buys time for workers to evacuate safely and for emergency services to arrive.

ROCKWOOL SeaRox A60® wired mats protect both people and equipment in HVDC DolWin2, as well as providing thermal and acoustic insulation – protecting assets worth millions of euros and helping to secure Europe's renewable energy supply.

ROCKWOOL wired mats protect assets worth millions of euros and help secure Europe's renewable energy supply.

Vertical oasis

In this ultra-modern tower, stone wool helps create a haven of safety, calm and comfort at the heart of a bustling metropolis

MahaNakhon, Bangkok, 2016

Intended as a "physical representation of Bangkok rising on the world stage", at 314m MahaNakhon is this huge city's tallest building and a powerful symbol of Thailand's progress. Its name means "great metropolis" in Thai and with a hotel, apartments, green spaces, a shopping mall and offices, the tower – with its distinctive 'pixelated' design – is a modern city in the sky. And as with any city, MahaNakhon's challenge is to create a space that combines comfort and safety for its inhabitants with minimum impact on the environment.

The architects, developers and occupants, including the Ritz-Carlton Hotel Company, which manages the hotel and apartments, were all focused on both sustainability and safety in this 77-storey construction project. MahaNakhon incorporates a range of features designed to reduce its environmental footprint, from energy-saving materials and systems to a landscaped area of greenery. ROCKWOOL stone wool is part of this sustainability story, used in the building's curtain wall system to insulate against Bangkok's ever-present heat, as well as helping muffle the noise of this busy city.

But in a tower of this scale, fire safety is of the highest importance. The non-combustibility of stone wool made it a natural choice for fire protection. In MahaNakhon, ROCKWOOL products are installed between the floors and in the walls, where they will help to compartmentalise any fire and slow its spread, giving people more time to get to safety should a fire happen.

With its contribution to sustainability, safety and comfort, ROCKWOOL stone wool is part of the unique, modern landscape of Bangkok's future.

In a tower of this scale, stone wool is a natural choice for fire protection.

The crown jewel of a dynamic country

"This year marks 21 years since the completion of the Petronas Twin Towers, Malaysia's crown jewel and a symbol of the nation's ambitions and aspirations."

Jeff Wilcox, Managing Director, ROCKWOOL South Asia

Safety and comfort are built in to this internationally recognised landmark

Petronas Twin Towers, Kuala Lumpur, Malaysia, 1996

Built to symbolise Malaysia's forward-looking optimism, the 451.9-metre Petronas Twin Towers was the tallest building in the world for eight years and it remains the tallest twin structure in existence. It is built to rigorous safety standards, standing on the world's deepest foundations and constructed largely from reinforced concrete.

Fire resilience – the ability for a building to contain and rapidly recover from a fire – is a key consideration in any project on this scale, so contractors imposed strict specifications on the materials used. With an extremely tight construction schedule, they also sought out local suppliers to ensure on-time delivery. The qualities of ROCKWOOL stone wool, coupled with the fact that we manufacture stone wool locally, made the product a clear choice for this colossal project. After we jointly built and tested the Towers' curtain wall system to assure two-hour fire resistance, around 900 tonnes of stone wool (the weight of a small ship) were ultimately installed in the floors, ceilings and walls.

The insulation does more than help keep the building's thousands of occupants safe. In a city that's near the equator and close to 30°C all year round, stone wool improves thermal performance, reducing the amount of energy needed for air conditioning. Insulation in the ceiling also contributes to better acoustics.

Commenting on the project, ROCKWOOL South Asia Managing Director Jeff Wilcox said: "This year marks 21 years since the completion of the Petronas Twin Towers, Malaysia's crown jewel and a symbol of the nation's ambitions and aspirations. As a company, our contributions to making buildings like the magnificent Petronas towers safer and more comfortable also marks a milestone in our presence in Malaysia over the last 35 years. And just as this nation continues to grow, so does its people's need for a better quality of life. Thanks to our product portfolio and our continuous R&D efforts, we are in a privileged position to meet these needs and enrich the lives of people and cities such as Kuala Lumpur."

The development that makes a difference

Developers chose ROCKWOOL Thermalrock® insulation for the curtain walls, where it helps maintain an optimum indoor climate and contributes to Wangjing SOHO's LEED certification.

Curved, tapered design combines with excellent energy performance to help Wangjing SOHO stand out in Beijing

Wangjing SOHO development, Beijing 2014

Zaha Hadid Architects are famed for their mould-breaking designs, which introduce sweeping curves and eye-catching shapes into urban landscapes often dominated by uniform, rectilinear buildings. Wangjing SOHO, one of their recent projects, is a mixed-use development between Beijing's centre and its airport, intended to create an identity for a thriving area that plays host to cultural institutions and creative, IT and telecoms companies.

Wangjing SOHO's innovation in design is matched by its environmental performance. The development uses an impressive range of eco-friendly technologies, from high-performance glazing and sun shading to heat recovery and water management systems. Insulation of the building's envelope also plays an important part in reducing the heating and cooling costs.

After a rigorous selection process, the developers chose ROCKWOOL ThermalRock® insulation for Wangjing SOHO's curtain walls, where it helps maintain an optimum indoor climate for the people who work in the building, and contributes to its LEED environmental certification.

With its flowing design and excellent environmental performance, Wangjing SOHO is making a positive impact on the Beijing cityscape.

Protection for millions of passengers

ROCKWOOL stone wool insulation helps HKIA to use less energy, and to provide high levels of safety for passengers.

Built using ROCKWOOL insulation, this vast airport is a safe and comfortable place for air travellers

Hong Kong International Airport, 1998

Hong Kong International Airport (HKIA) is a place of records. It's the busiest cargo airport in the world and the eighth-busiest passenger airport; it covers 1,248 hectares, on an artificial island; and one of its terminals was briefly the world's largest. In 2016, over 70 million people passed through the airport. And in 1999 it was voted one of the Top 10 Construction Achievements of the 20th Century.

HKIA is famous for its design, which emphasises sustainability and passenger experience as well as aesthetics. Its wave-like single-span roof lets in natural light but shields people from direct sunlight, reducing both energy use and the amount of artificial lighting needed.

ROCKWOOL stone wool insulation helps HKIA to use less energy, and to provide high levels of safety for passengers. Its inclusion in the roof improves thermal performance in Hong Kong's hot and humid climate, creating more comfortable conditions for passengers and helping HKIA become for first project to be awarded a BEAM Plus rating by the Hong Kong Green Building Council. Passenger safety is also a high priority at any airport. Rocksafe® and CurtainRock® are used in HKIA's buildings to improve fire resistance by helping stop the spread of fire.

No matter how impressive their scale, buildings can create a pleasant and protective space with ROCKWOOL insulation.

An insight from Kirill Fedorovskiy

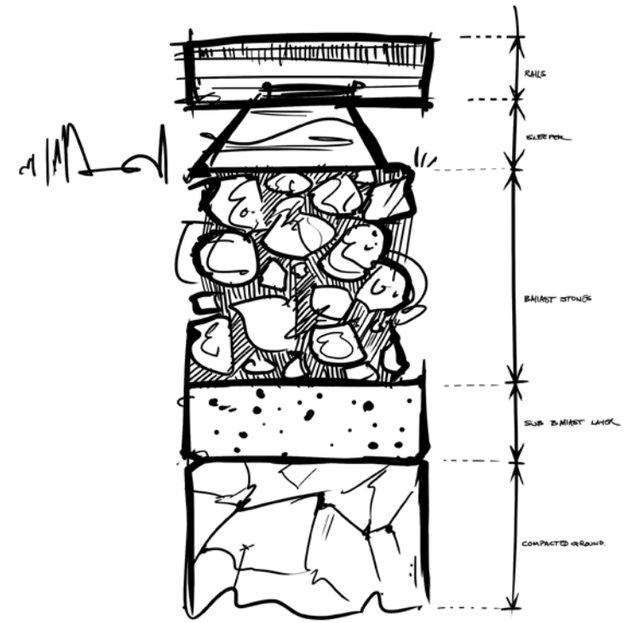
Vice President Finance

The many high-profile projects that feature ROCKWOOL stone wool show what we can do.

Having worked in different positions across the globe and now in the North American team, I have a strong sense of the 80-year history that has brought the company to where it is today. It is extremely inspiring to be part of an organisation that continuously drives positive change and sustainable growth.

When more and more people are moving to cities, there's a huge opportunity for our products to improve lives while at the same time reducing humanity's impact on the environment. The many high-profile projects that feature ROCKWOOL stone wool show what's possible.

It is very motivating to provide the market and customer insights that contribute towards this purpose, working with colleagues across the entire Group who share this common goal. We are uniquely positioned to improve people's wellbeing and help achieve environmental goals and I am proud that the Group's commitment in these areas stands unchanged.



"It is extremely inspiring to be part of an organisation that drives positive change and sustainable growth"

Fire-safe tyre production

Specialised insulation protects a major new greenfield tyre factory from fire and weather damage

"...we installed ROCKWOOL's Rockfall cut to fall system. Fire safety is one of the most important issues on the roof. As the protection of fire, all the ROCKWOOL offered and installed insulation products meet the highest 'A1' fire protection category."

István Németi, Site manager*

Apollo Tyres factory, Gyöngyöshalász, Hungary 2016

Built on a 72-hectare site 100km from the capital Budapest, the new Apollo Tyres factory is one of the largest greenfield investments in Hungary and marks the first new factory for the company outside India, where it is headquartered. By the time its first phase is completed, the factory will be able to produce 5.5 million car and light truck tyres each year, and 675,000 commercial vehicle tyres, under the Apollo and Vredestein brands.

For any facility on this scale, safety is paramount. And for a tyre factory, where raw materials and end products are readily combustible, this means a strict focus on fire safety. To achieve this, architects CÉH zRt. specified ROCKWOOL insulation, based on their past experience of its quality and fire protection, and because of the wide range of product options available.

In total, 190,000 m^2 of ROCKWOOL insulation was built into the Apollo factory's roof, including 80mm-thick DACHROCK® insulation boards and SF 50 trapezoidal fillers, contributing to its A1 Fire Class rating, the highest possible. And because flat roofs can be susceptible to poor drainage that shortens their life, the Apollo factory also used ROCKFALL "cut to fall" insulation, whose blocks are custom-tapered to provide a sloping surface that allows water and snow to drain away.

As well as protecting against fire and making the building more durable, stone wool insulation improves the interior climate for factory workers, and reduces the owners' energy bills and carbon footprint. It's helping make this new facility sustainable for the long term.

Growing more with less

Prolific and award-winning Polish tomato growers, the Kazmierczak family adopted our Growing Media solutions several years ago and haven't looked back since

Kazmierczak Family, Poland

The Kazmierczak family have noticed a real difference in their day-to-day work with Grodan®, a ROCKWOOL Growing Media solution. Irrigation is better, easier, and more controllable, and the growing season now extends into mid-November. They can reduce water usage too: tomatoes cultivated in a precision growing system with Grodan consume three to four times less water per kilogram compared with field-based cultivation.

And the Kazmierczaks can now monitor their operation remotely over the internet, even checking on their plants' roots. Through our Young Grower Project, they can benefit from advice at seminars, at the point of installation and through aftercare service.

Our solutions are helping growers around the world to grow more using less water, protecting our environment and feeding an ever-growing population.

"If you compare cultivation on stone wool and in the ground, I am for stone wool, because it offers more precise control and therefore more accurate dosage of fertilisers and irrigation."

Ernst Kazmierczak, Polish tomato grower

History restored

Warsaw's art-nouveau market hall is reborn as a 21st century commercial and culinary hub

Hala Koszyki/Koszyki Hall, Warsaw, Poland, 2016

Built between 1906 and 1908, the Hala Koszyki, which describes itself as a "Warsaw crucible", has been an important social and commercial space throughout the past century. The market hall has seen many changes since it was first built, the most recent of which was a major restoration and refurbishment completed in 2016.

This project, which has given the hall back its status as a thriving city destination, is a fusion of the old and the new. The developers restored Koszyki Hall's elaborate art-nouveau features while at the same time introducing modern materials and the highest environmental and safety standards.

ROCKWOOL stone wool is perfect for sensitive restorations like this. Over 8,800m^2 of the material helped developers to meet contemporary standards for fire safety, energy efficiency and acoustic performance while protecting the hall's original structure and design features. Today, Koszyki Hall has been brought back to life as a lively space for eating, shopping and culture – and become once again an essential stop on any visit to the city. As project manager Michał Grocki says:

"Koszyki Hall is characterized by uncompromising performance durability, which was influenced by the most modern technological solutions and by the human factor. It shows that the restored usability of a place can go hand in hand with the beauty of the space".

"Koszyki Hall is characterized by uncompromising performance durability, which was influenced by the most modern technological solutions and by the human factor. It shows that the restored usability of a place can go hand in hand with the beauty of the space."

Michał Grocki, Project Manager

New heights of protection

Europe's tallest freestanding structure uses stone wool to meet rigorous fire safety standards

Ostankino Tower, Moscow, Russia, 2015

Built in the 1960s, the 540-metre tall Ostankino tower broadcasts TV and radio from near to the centre of Moscow. It's a popular tourist destination, featuring observation decks and an equipment museum. Since a recent renovation, Ostankino also offers visitors several new experiences including a "technical route" through the inside of the building, including the transmitter hall and the cables that give the tower stability.

The Ostankino tower has a complex interior, with wiring, water and sewerage pipes running through the structure. When a building this tall is filled with electrical equipment, fire safety is of paramount importance, not just to keep people safe but also to protect valuable assets. During the tower's refurbishment, contractors used ROCKWOOL ALU1 WIRED MAT 80® for fire protection. As well as withstanding temperatures above 1,000°C, this versatile stone wool product includes a galvanized wire grid that helps stop systems and structures from collapsing in the event of a fire. It's also light in weight, and coated with aluminium foil to provide additional fire protection – and a distinctive aesthetic.

ROCKWOOL stone wool is helping ensure this important landmark stands tall long into the future.

Used in the tower's refurbishment, ROCKWOOL wired mats withstand temperatures above 1,000°C and help stop systems and structures collapsing in the event of a fire.

Extreme shelter

Modern insulation creates a cosy refuge for hikers and mountaineers

Skuta Alpine Shelter, Slovenian Alps, 2016

Slovenia's Kamnik-Savinja alps are a popular destination for lovers of the outdoors. With stunning views and many peaks, they are beautiful to visit but can be a forbidding place to stay. The average annual temperature at 2,000 metres is around freezing level, and in winter it can drop as low as -20°C, with high winds and snow on the ground for over six months of the year. Hikers had long been able to take temporary or overnight refuge in a small shelter beneath Mount Skuta, but this old structure was in need of replacement.

The solution came from a team of students at Harvard Graduate School of Design, who had been tasked with designing a practical shelter for an extreme environment. Working with local architects OFIS, they completed the new project in 2016. Few locations can be more spectacular and exposed than the vertiginous site the new shelter perches on; yet few mountain refuges offer the shelter and comfort of the Skuta Hut.

ROCKWOOL contributed to the project with its Airrock product. This makes it possible for people to stay safe and comfortable in an unheated structure while the mountain weather rages outside. It was the ideal material for the project: light to transport (the building was partially pre-fabricated and lifted onto the mountain by an army helicopter); non-hygroscopic, so it resists condensation and thermal bridges; and easy to fit. Most importantly, stone wool keeps people comfortable whatever the weather. It retains its properties over its long service life regardless of temperature, maintaining a thermal conductivity of 0.035 W/mK. And as a non-combustible substance, it acts as a fire barrier too.

As Janez Martinčić, Senior Project Leader at OFIS architects says, our stone wool was the perfect fit for the project: "The extreme climatic conditions in the mountains introduce a design challenge for architects, engineers and designers. ROCKWOOL products and its philosophy of providing solutions that are natural, durable while securing firesafe and thermal protection, even in the harshest conditions, fitted perfectly in our project".

"ROCKWOOL products and its philosophy of providing solutions that are natural, durable while securing firesafe and thermal protection, even in the harshest conditions, fitted perfectly in our project."

Janez Martinčić, Senior Project Leader, OFIS Architects

Cultural preservation

Stone wool was an ideal choice, as it fits easily into uneven spaces and provides the fire protection that is so important in such a valuable and frequently visited building.

Renovating the world's largest museum for future generations

State Hermitage, St Petersburg, Russia, 2013

The baroque splendour of Russia's State Hermitage houses millions of artworks, including the world's largest collection of paintings. Spread across the bank of the River Neva in St Petersburg, it is a collection of buildings dating back as far as 1764, each characterised by lavish, elaborate architecture.

Any refurbishment of such a priceless cultural monument needs to be carried out with great care and in a way that respects the building's age and complexity. ROCKWOOL stone wool was an ideal choice for the roof insulation, as it fits easily into uneven spaces and once installed, provides the fire protection that is so important in such a valuable and frequently visited building. The RUF BATTS® roof insulation used at the State Hermitage also help to keep the building at an even temperature in a city with hot summers and freezing winters.

Today, ROCKWOOL stone wool is helping ensure that millions of visitors can continue to enjoy the Hermitage's vast collections in comfort and safety for many years to come.

Soaring comfort

ROCKWOOL insulation keeps travellers safe and warm in St Petersburg's spectacular new airport terminal

Pulkovo Central Passenger Terminal, St Petersburg, Russia 2014

The designers of St Petersburg's new airport terminal faced a tough challenge. How do you create a light, airy and dramatic structure that keeps passengers comfortable and safe in the harsh climate of northern Russia? The city experiences warm summers and cold, dark winters, and large structures such as airport terminals can be hard to heat, as well as having difficult acoustic conditions.

Yet by the third quarter of 2015, the year after the new terminal was completed, Pulkovo Airport ranked first in Europe for overall passenger satisfaction in an International Council of Airports survey. The architects had succeeded in creating a light-filled, spacious design that echoes the gilded domes of St Petersburg's churches and the city's Soviet-era geometry, while ensuring perfect interior conditions for passengers.

ROCKWOOL thermal and acoustic products helped the new terminal to achieve this. Around 40,000m² of thermal insulation (an area the size of nearly six soccer pitches) was used in the roof, with 30,000m² of acoustic insulation used in partitions within the terminal. The combination of ROCKWOOL insulation's light weight, strength and fire safety made it the perfect choice for Pulkovo's soaring roof structure, helping create an ideal interior climate while reducing the energy needed for heating and air conditioning. And our stone wool insulation, which withstands temperatures above 1,000°C, contributes to the terminal's safety standards by helping prevent the spread of fire.

With help from ROCKWOOL insulation, air journeys to and from St Petersburg can start and finish in comfort and safety – and in spectacular surroundings.

Around 40,000m² of thermal insulation (an area the size of nearly six soccer pitches) was used in the roof.

Creating peaceful sleepers in Stockholm

Using the acoustic properties of stone, our insulation helps protect homes above the Stockholm metro from noise and vibration.

Stockholm metro, Sweden 2016

Everyone wants to be able to travel easily around the cities they live in. But as populations grow, the desire for easy urban mobility can come into conflict with the need for a peaceful and stress-free life. Motorised vehicles and mass transit systems cause noise and vibration that affects people and the buildings they live in.

In cities looking to protect historic buildings as well as improve residents' quality of life, it is especially important to manage the impact of urban transport. The Stockholm metro uses Rockdelta® stone wool products to enable trains to operate beneath the city without generating any noise or vibrations in the buildings above the tunnel.

As well as insulating against sound, stone wool absorbs and dampens ground-borne vibration from the train tracks, reducing the impact on surrounding structures as trains pass. And because it is exceptionally durable even in extreme conditions, it provides a lasting solution for transport infrastructure that has a long service life.

For Stockholm, this means a more peaceful life for residents, and a longer life for buildings and other structures that are now better protected from fatigue caused by vibrations.

Stone wool products enable trains to operate beneath the city without generating any noise or vibrations in the buildings above the tunnel.

Healthy workplace

Combining beautiful design with sustainable materials, this corporate headquarters creates a perfect work environment

Novo Nordisk corporate headquarters, Denmark, 2013

Danish healthcare company Novo Nordisk, a leader in diabetes care, wanted its new corporate headquarters to reflect its heritage while creating a bright, open environment that was a safe, healthy workspace for its employees. Henning Larsen Architects responded with a stylish circular design inspired by the shape of insulin molecules, which contained many references to the Scandinavian design tradition and was built with sustainable materials.

The building's shape and its large, open atrium called for acoustic insulation that adapted easily to curved surfaces while preventing unwanted sounds from disturbing the peace of the space. For this reason, the architects chose Rockfon® products for the atrium's horizontal and vertical surfaces. According to architect Søren Øllgaard, "Rockfon® Mono® Acoustic made it possible to create a stunning design with continuous surfaces that tie the room together. On top of that, it was a bonus to be able to make these flexible ceilings and walls, which still maintain their good acoustic properties." Øllgaard also noted the aesthetic value of Rockfon: "With its continuous surfaces, it creates a unity, draws light in an exciting way and provides a more interesting look with its rustic surfaces."

Fire safety was also extremely important in this new building, to protect employees as well as the valuable intellectual property and laboratory equipment it houses. ROCKWOOL Conlit® solutions together with external roof insulation, were used to meet Novo Nordisk's high fire safety standards.

Commenting on the project, ROCKWOOL Group Marketing Director Christian Jølck said:

''In ROCKWOOL we are proud of being chosen as the supplier of insulation for these marvellous buildings… our solution improves the indoor wellbeing by providing a comfortable indoor climate and a good acoustic sound environment for everybody in the buildings''

"With its continuous surfaces, it creates a unity, draws light in an exciting way and provides a more interesting look with its rustic surfaces."

Architect Søren Øllgaard

An enduring symbol of Denmark

Fire-safe renovation secures the future of this royal palace

Amalienborg,
Denmark, 2004

Built between 1750 and 1760, Amalienborg is the home of the Danish Royal Family and an important part of the country's cultural heritage. It comprises four separate palace buildings, one of which, Frederik VIII's palace, houses the Crown Prince and his family.

This palace underwent a thorough exterior and interior renovation from 2004-2010 before its current occupants moved in. The aim was to create a home that is safe and sustainable to live in, while at the same time assuring the future of this historic building.

ROCKWOOL solutions were chosen for their fire safety, a prime concern in a building of cultural significance that is also at the heart of Copenhagen and just a few metres away from neighbouring buildings. Using stone wool in the renovation also reduces energy consumption, cutting running costs and reducing the palace's impact on the environment, an important concern in a country with a strong focus on sustainability.

Protected by stone wool insulation, all Amalienborg's occupants can enjoy modern standards of comfort and safety in this centuries-old building.

Using stone wool in the renovation also reduces energy consumption, cutting running costs and reducing the palace's impact on the environment.

Built for generations to come

“We compared the Environmental Product Declaration of the Rockpanel boards with those of other cladding materials. It turned out that the boards made from sustainably sourced basalt have a lower environmental impact both in terms of energy use and CO_2 emissions during production.”

Jørn Kiesslinger, Architect and DGNB auditor at JJW Architects

ROCKWOOL products help create a sustainable space for learning

Sydhavn Skole/South Harbour School, Copenhagen 2017

Good education depends on a comfortable, healthy learning environment. But the architects of South Harbour School went several steps further when they created this award-winning building: they gave the school an exterior that communicates inclusiveness and dynamism, and a form and design that blend seamlessly into its waterfront surroundings.

South Harbour is also built to stringent energy standards. It uses power and resources as sparingly as possible, meeting the strict Danish building legislation that has made low-energy building the standard in 2015.

ROCKWOOL materials have been instrumental in helping South Harbour School combine creativity with sustainability and safety. Its colourful exterior, which features quirky graphics, is made from custom Rockpanel® cladding. The cladding boards are made from compressed stone wool, which use less energy to produce than alternative products, are fully recyclable the end of their long lifetime and offer the highest levels of fire safety.

Teachers and students at South Harbour School can also learn without disruption from corridor noise, machinery, or the sound of distant voices, thanks to Rockfon ceilings. The improvements they make to interior acoustics mean teachers can be heard clearly and any noisy activities do not disrupt other classes. And through the school year, ROCKWOOL insulation helps maintain a comfortable indoor environment while also minimising the school’s energy demand.

The school’s architects went to great lengths to screen materials for sustainability: “We compared the Environmental Product Declaration of the Rockpanel boards with those of other cladding materials. It turned out that the boards made from sustainably sourced basalt have a lower environmental impact both in terms of energy use and CO_2 emissions during production. According the EPD, the product life of the Rockpanel products is 60 years, another important point when we want to build in a sustainable way.” Jørn Kiesslinger, Architect and DGNB auditor at JJW Architects, Copenhagen

With its combination of durable ROCKWOOL materials and sensitive design, South Harbour School is built to last for generations to come.

Green power at the heart of the city

New waste plant brings cleaner energy and a spectacular leisure facility to Copenhagen

Amager Bakke/Copenhill, Copenhagen, Denmark, 2017

How can a capital city become zero-carbon by 2025? Amager Bakke, Copenhagen's ingenious energy-from-waste plant, is a big part of the answer. It transforms the waste from up to 700,000 households into electricity and district heating, emits over 90 less sulphur and NOx than the plant it replaces, and recovers water and metals. And the builders are so confident of Amager Bakke's green credentials that it also doubles as a leisure facility, featuring an 80-metre-high artificial ski slope and a climbing wall. Architects Bjarke Ingels Group deliberately designed the plant to be "part of the city", providing social as well as physical infrastructure.

State-of-the-art technology features throughout Amager Bakke, enabling it to extract 100 percent of the waste's energy content, and generate electricity from waste at 28 percent efficiency. It's also the first installation in Denmark to use Selective Catalytic Reduction technology, which cleans flue gases to minimise NOx emissions.

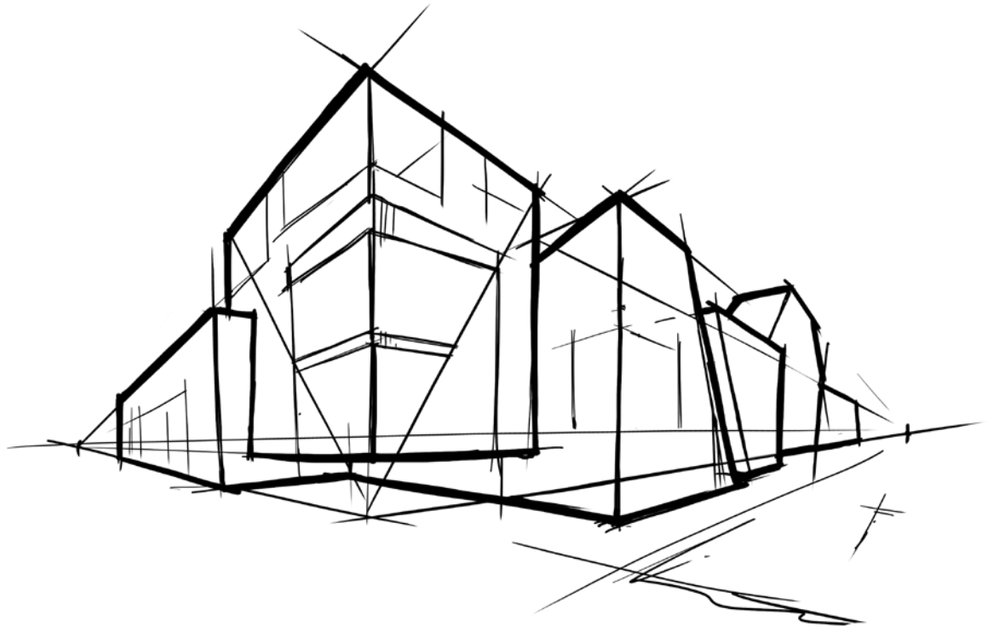
To achieve these levels of energy efficiency while protecting workers and nearby residents from fire risk, Amager Bakke needed high-performance materials. ROCKWOOL stone wool helps the plant to achieve its high environmental standards. Installed around pipes and elsewhere within the facility, its insulation properties contribute to the thermal efficiency of the waste-to-energy process, as well as protecting workers from hot surfaces and improving fire resilience. At Amager Bakke, the ROCKWOOL Group is at the heart of Copenhagen's sustainability story.

ROCKWOOL products contribute to the thermal efficiency of the waste-to-energy process, as well as protecting workers from hot surfaces and improving fire resilience.

Image provided by photographer, Christoffer Regild

An insight from Tom Kähler

Former CEO of the ROCKWOOL Group



The ROCKWOOL Group did not invent stone wool, however, by the 1970s, we had become a global leader in the industry.

There were two main reasons for this: good managers, and a certain culture and way of doing things that developed in the Group over the years. Our recent strong achievements are also founded on these same attributes that were developed over forty years ago.

What makes up our way of doing things? Good R&D makes sure we are always finding new ways to use our product. Our employees have a culture of respect for everyone they work with; and we place focus on communicating well, so managers and employees alike know what's happening throughout the company and its markets. We are also transparent and considered in our decision-making, and have a tradition of careful financial management. Finally, clear job descriptions and lines of accountability mean that everyone is enabled to do their job to the best of their abilities. Together, these qualities have made it possible for ROCKWOOL Group to achieve the sustainable position of industry leadership that it is proud to occupy today.

"These qualities have made it possible for ROCKWOOL Group to achieve the sustainable position of industry leadership that it is proud to occupy today."

ROCKWOOL logo history

1936

c 1948

1957

1961

ROCKWOOL

2011

ROCKWOOL®
FIRESAFE INSULATION

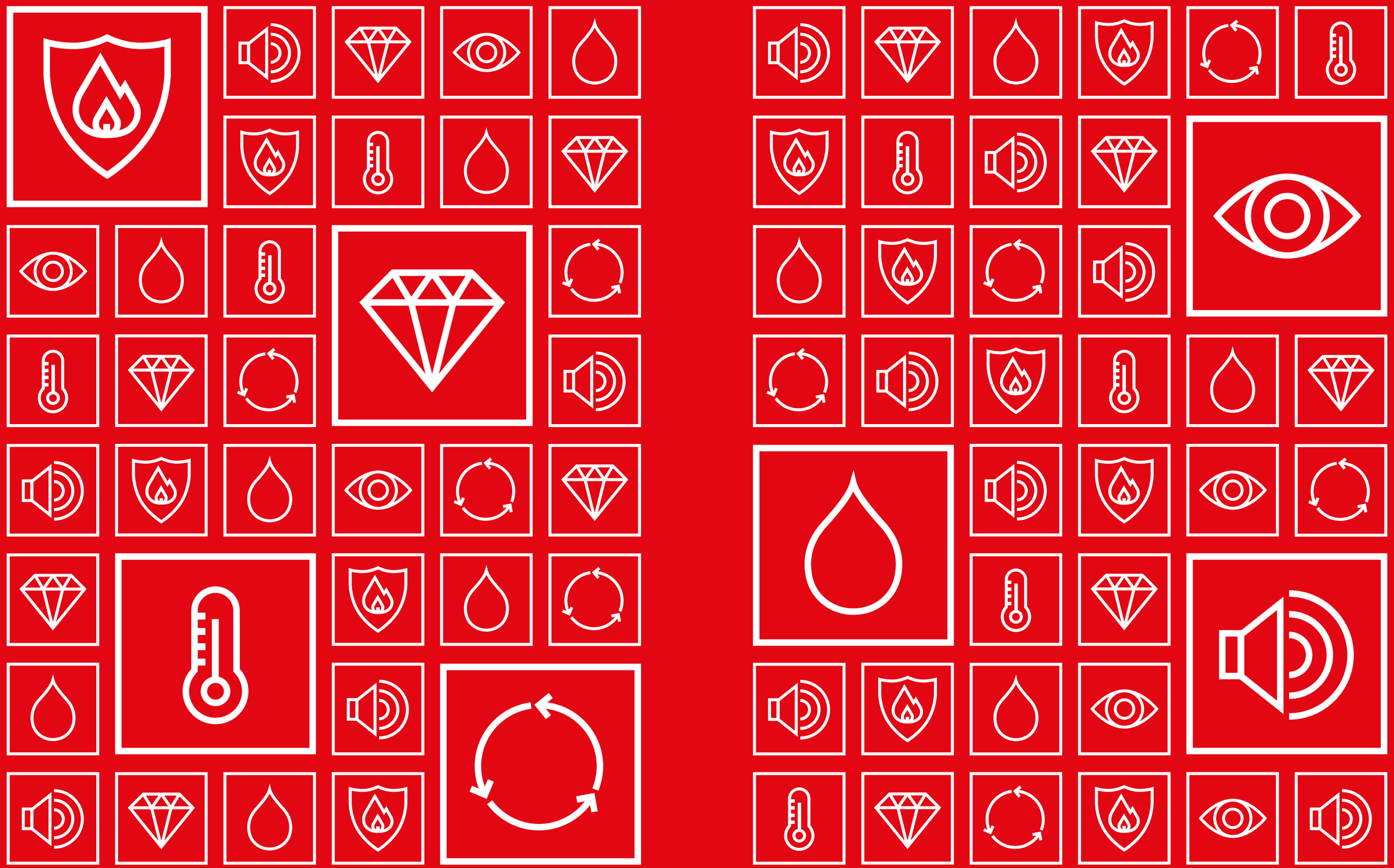
2017

ROCKWOOL®

8TH 80 ANNIVERSARY

At the ROCKWOOL Group, we're committed to enriching the lives of everyone who experiences our solutions. Our expertise is perfectly suited to tackle many of today's biggest sustainability and development challenges, from energy consumption and noise pollution, to fire-resilience, water scarcity and flooding. Our range of products reflect the diverse needs of the world, while supporting our stakeholders in reducing their own carbon footprint.

Stone wool is a versatile material and forms the basis of all our businesses. With over 11,000 passionate colleagues in 39 countries, we're the world leader in stone wool solutions, from building insulation to acoustic ceilings; external cladding systems to horticultural solutions; engineered fibres for industrial use to insulation for the process industry – as well as marine and offshore.



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