

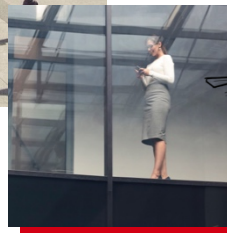


# Energy efficiency by ROCKWOOL

## Case studies

October 12th 2017

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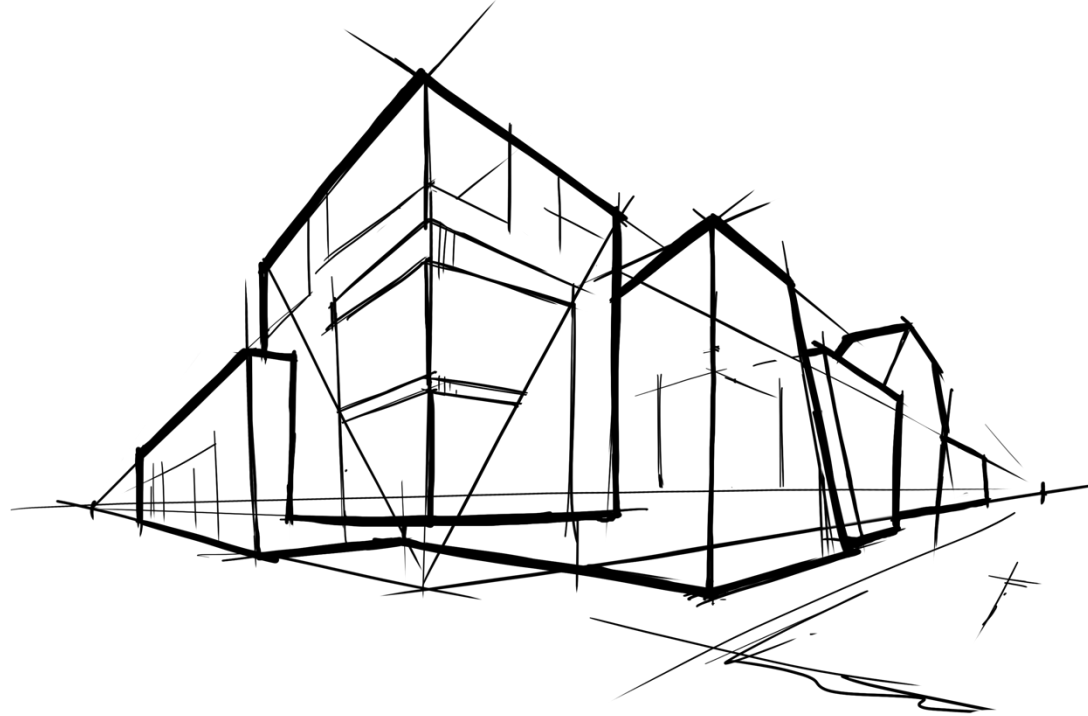
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# Global challenges – Urbanization

41

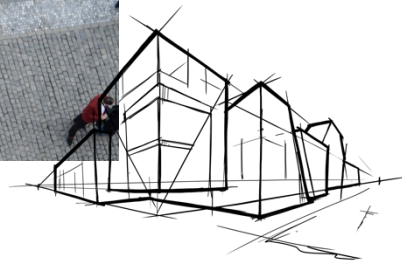
Mega-cities with  
10 million inhabitants  
by 2030

1M

People move to  
urban environments  
every week

50%

More food and 17%  
more water will be  
needed by the urban  
population by 2050



# Global challenges – Energy Consumption

If no action is taken,  
energy consumption  
is expected to rise by

# 50%

by 2050

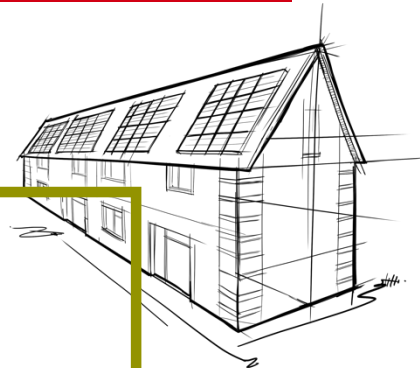
# >33%

Buildings account for  
over 33% of the energy  
used globally

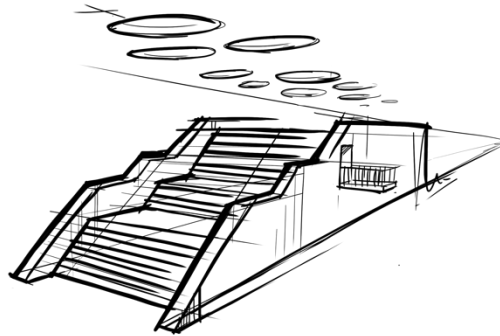
Up to

# 90%

The potential for energy  
savings in new and existing  
buildings globally is 50-90%



# Global challenges – Health and wellbeing



**30%**

of Europeans' sleep  
is currently disturbed

**35%**

of total waste generated  
globally comes from  
the building and  
construction industry

**>50%**

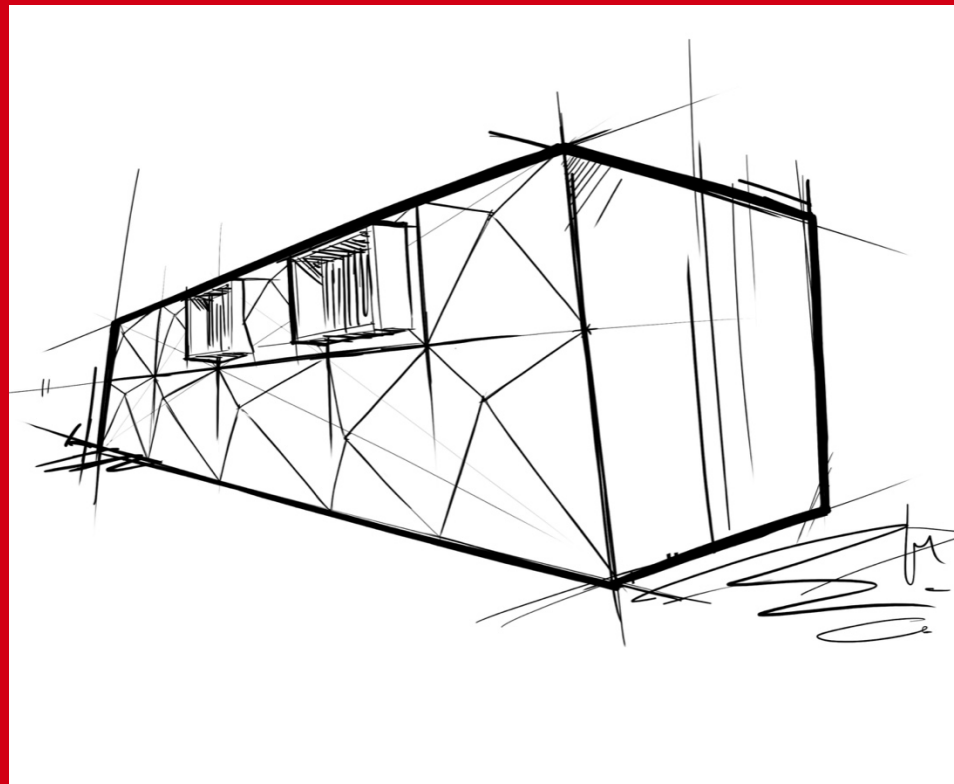
of Europeans who lose  
their lives in fires die from  
the impacts of smoke and  
toxic gases



# 2

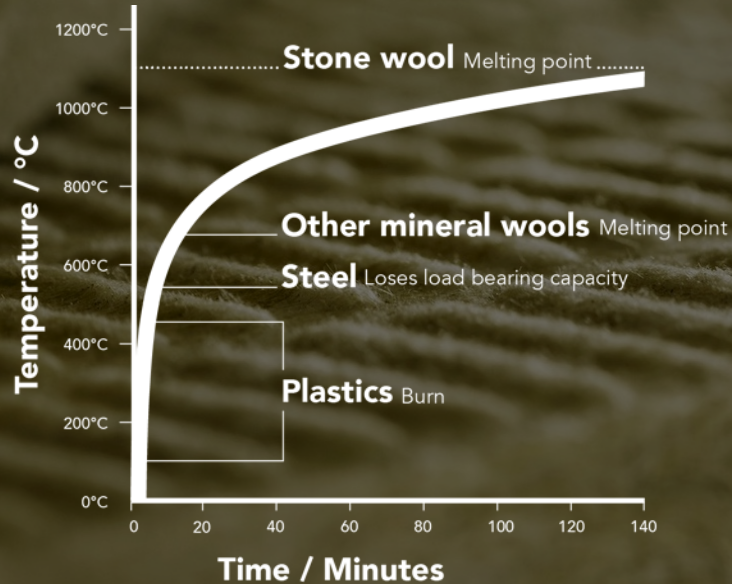
## Why stone wool?

- Fire resilient
- Sound absorbing
- Durable
- Abundant



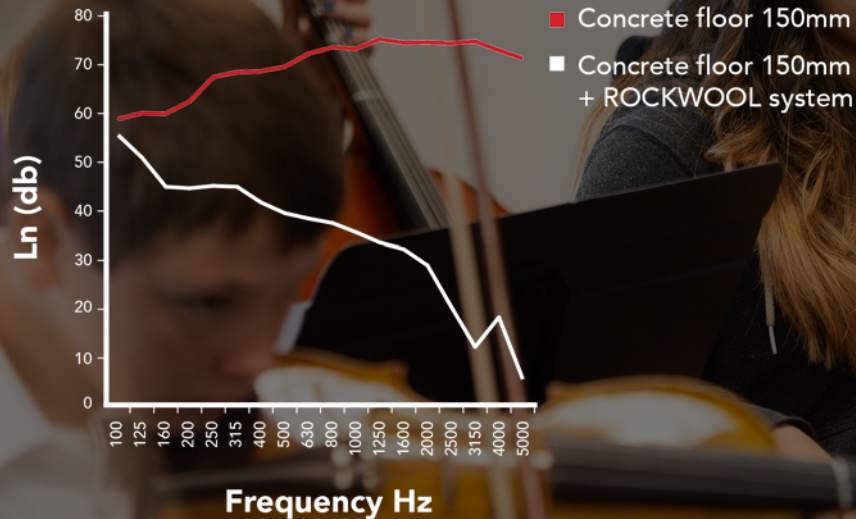
# We are all about Resilience

ROCKWOOL stone wool can withstand temperatures up to 1000°C



# We shield your spaces from unwanted noises

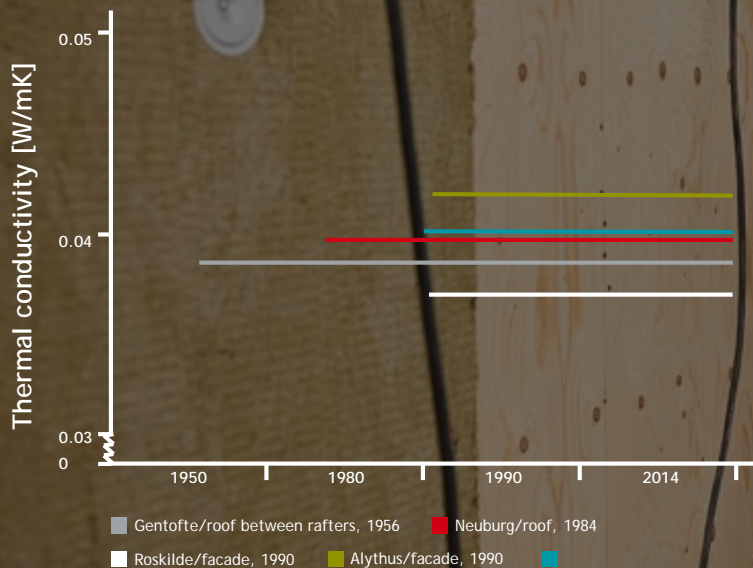
A slamming door, a displaced table, heels impacting on a floor: these are some examples of impact noise sources. ROCKWOOL stone wool can reduce the transmission of impact sound





# We are in for the long-term

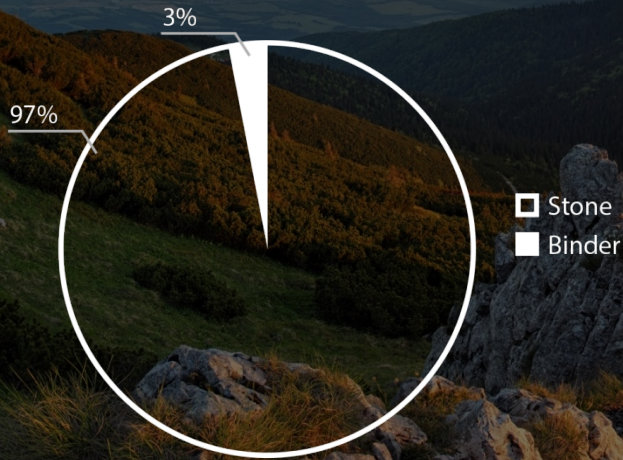
The thermal performance of ROCKWOOL stone wool remains unaltered for more than 55 years





# It is nature giving back to nature

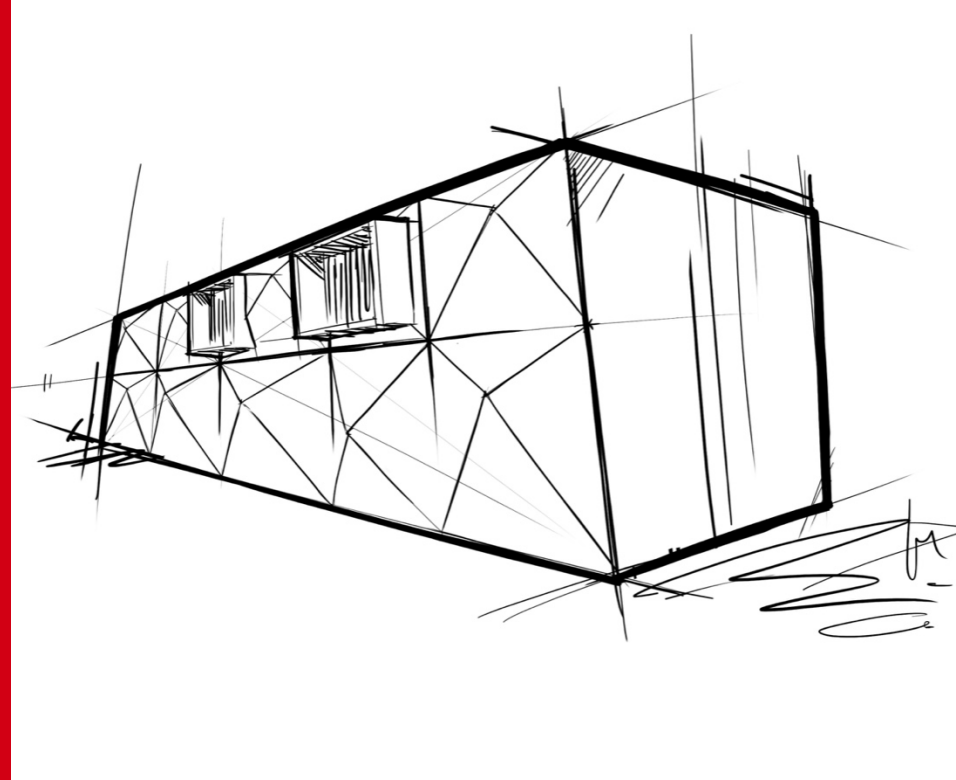
ROCKWOOL stone wool production process uses about 97% of mineral materials – basalt, gabbro, as well as recycled materials (e.g. stone wool, briquettes, slag). The remaining 3% are binders.



# 3

## Why ROCKWOOL?

- Our Purpose
- Our year at a glance
- Rich history
- Global presence
- Diverse product portfolio





# Our purpose

At the ROCKWOOL Group, we are committed to enriching the lives of everyone who comes into contact with our products. Our portfolio is perfectly suited to tackle many of today's biggest sustainability and development challenges.

From energy consumption to noise pollution, water scarcity to flooding, our solutions help our customers address many of the big issues of modern living. Our range of products address the diversity of the world's needs, supporting our stakeholders in reducing their own carbon footprint along the way.

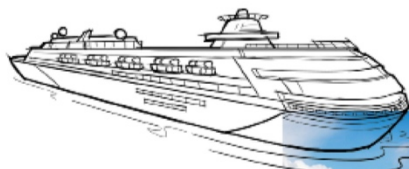




# Our year at a glance

## ROCKWOOL 2016

A focused industrial company with leading positions in insulation, acoustic ceilings and horticultural growing media based on proprietary stone wool technology.

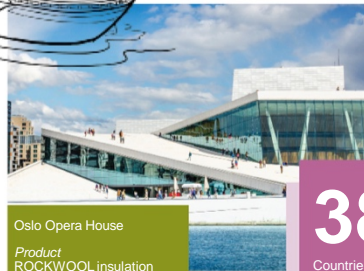


4.6bn

The life cycle impact of one year's production is equal to 4.6 billion tons of CO<sub>2</sub> savings, this represents about the same as all CO<sub>2</sub> emissions in the EU in one year.

Proposed dividend of DKK 18.80 per share totalling EUR 55.6 million

64%<sup>▲</sup>



Oslo Opera House

Product  
ROCKWOOL insulation  
and ROCKFON ceilings

Architect  
Snøhetta

38

Countries in which we operate

EURm 2,202

Total Group net sales in 2016

145%<sup>▲</sup>

Free cash flow EUR 237 million  
— up 145%



30%

Improvement in Environmental,  
Social and Governance (ESG)  
Criteria ranking in Denmark

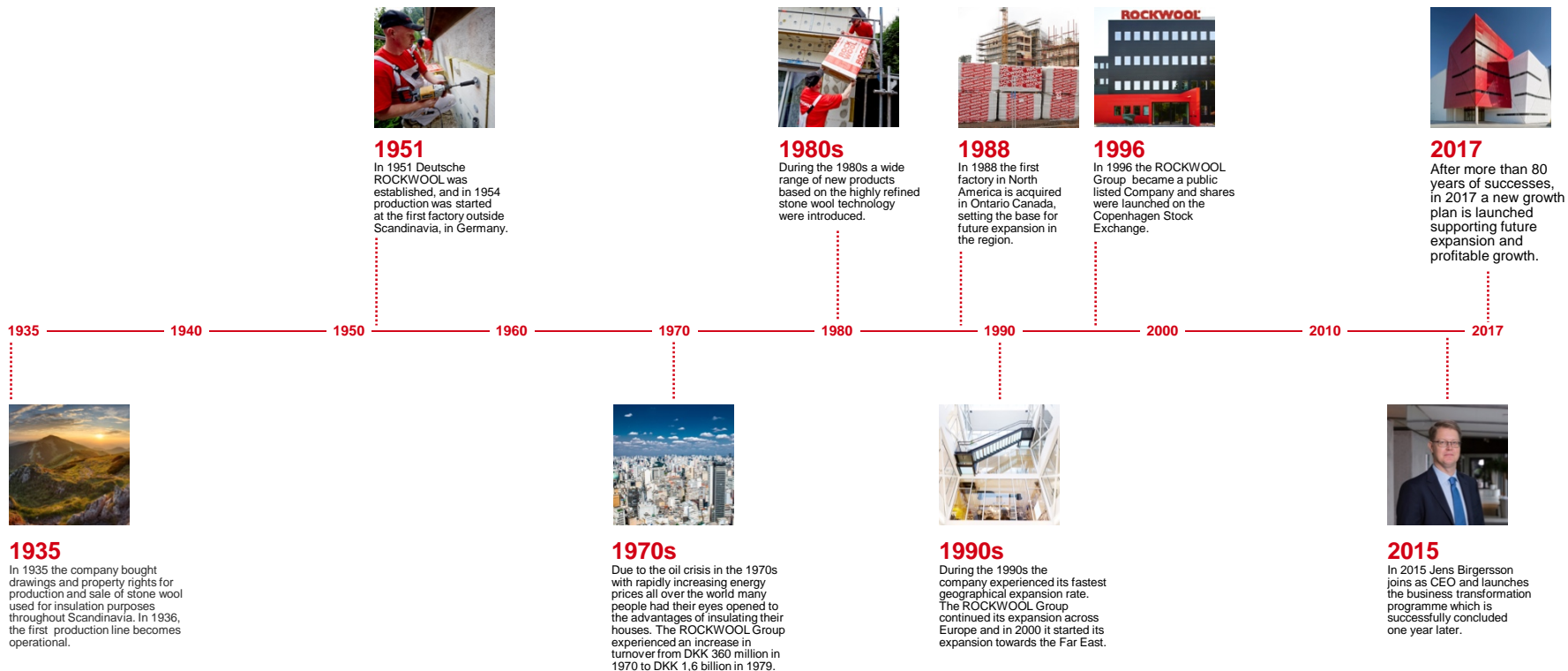


10,500

Employees worldwide



# More than 80 years of experience



# World leader with local presence

We create sustainable solutions to protect life, assets, and the environment today and tomorrow.

- ▲ Stone wool factory
- ▲ Other factory
- ▲ Sales office / administration



North America

3 stone wool factories, 2 ceiling grid plants  
Main business areas: Insulation, acoustic ceilings and horticultural substrates  
1,000 employees

Austria  
Belarus  
Belgium  
Bulgaria  
Canada  
China  
Croatia  
Czech Republic  
Denmark  
Germany  
Estonia  
Finland  
France  
Hungary  
India  
Italy  
Latvia  
Lithuania  
Malaysia  
Mexico  
Norway  
Philippines  
Poland  
Romania  
Russian Federation  
Singapore  
Slovakia  
Spain  
Sweden  
Switzerland  
Thailand  
The Netherlands  
Turkey  
Ukraine  
United Arab Emirates  
United Kingdom  
United States of America  
Vietnam



Europe

16 stone wool factories, 3 ceiling tile plants, 1 ceiling grid plant, 1 facade panel plant, 2 wall systems components plants

Main business areas: Insulation, acoustic ceilings, horticultural substrates, cladding boards, engineered fibres, and noise & vibration control

7,100 employees



Russia

4 stone wool factories, 1 ceiling tile plant

Main business areas: Insulation, acoustic ceilings and horticultural substrates

1,300 employees

Asia

5 stone wool factories, 1 ceiling grid plant

Main business areas: Insulation, mainly industrial & technical, and acoustic ceilings

1,100 employees





# Your choice of Insulation



**Technical insulation**  
solutions for process  
industry, marine and  
offshore

- Reduces heat loss and CO<sub>2</sub> emissions for industrial insulation
- It has a positive carbon footprint



**Firesafe insulation**  
for all types of  
buildings including  
ROCKWOOL wall  
systems

- 97% of stone wool can be recycled after use
- It does not burn or emit high levels of toxic smoke in a fire
- Provides firefighters critical extra time to save lives by slowing the spread of fire
- Durable and resilient
- Easy to fit and retrofit
- It has a positive carbon footprint



**Core solutions**  
Customised stone  
wool solutions to  
industrial partners

- It does not burn or emit high levels of toxic smoke in a fire
- Makes air-conditioning less noisy



# More stone wool secrets unveiled



Special fibres for e.g. automotive brakes

- Securing your vehicle can come to a stop
- Fully sustainable products throughout their life



Precision growing for the horticultural industry

- Support the most sustainable production of fresh and healthy vegetables
- Multiplies yields and saves water



Exterior cladding for buildings

- Durable and resilient
- Easy to fit and retrofit



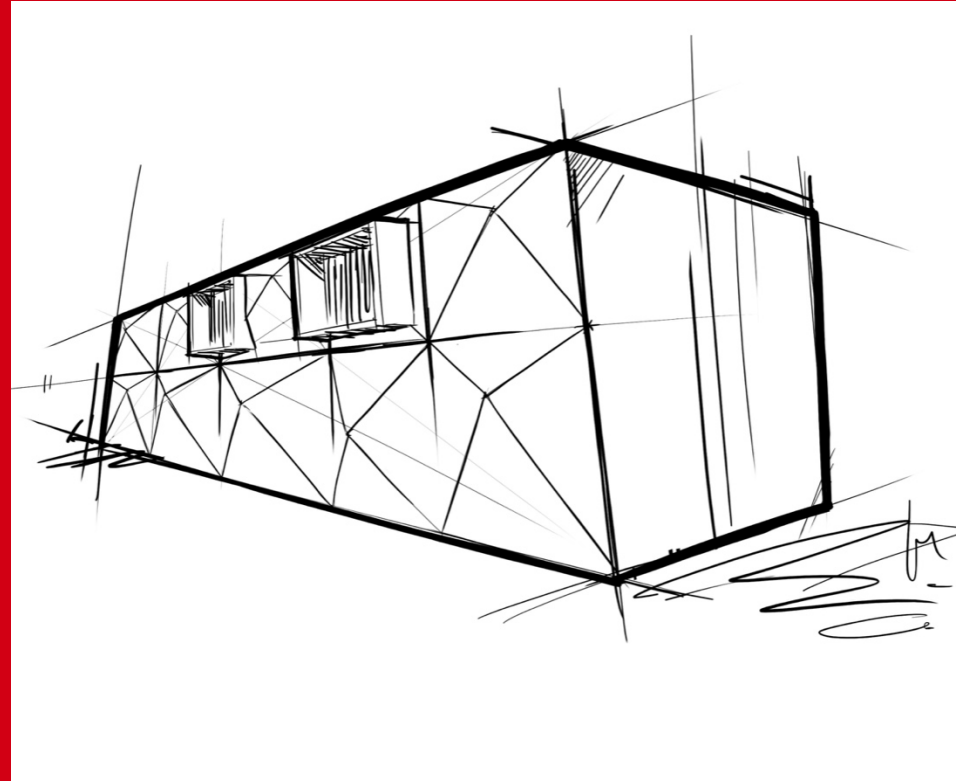
Acoustic ceiling and wall solutions

- Reduces noise and echoes
- Creates a comfortable indoor climate

# 4

## Case Studies:

- Public hospital Split
- Myhrerenga Borettslag



# Split Hospital

## Public hospital in Croatia halves its energy demand after ROCKWOOL supported Refurbishment

Croatia, like all of the 28 EU member states, is obliged to refurbish 3% of its public buildings each year. Since the majority of these buildings were built during the 1970s and 1980s, the potential energy savings are huge.

One of Croatia's most complex energy-efficiency renovation projects was recently completed in the city of Split, located on the Adriatic coast in the south of the country. A public hospital built in 1965 was modernised in a project valued at around €10 million (78 million kunas).

During the hospital's renovation between April and September 2016, the 37,000 m<sup>2</sup> building was brought up to the latest energy efficiency standards and the façade and roof were insulated with ROCKWOOL stone wool.





# Split Hospital

Over 30 Croatian companies and 350 workers participated in the refurbishment and the hospital was able to continue operating throughout the period.

With the renovation now completed, staff and patients at the hospital can enjoy a better building, with improved fire safety and significantly lower energy costs.

Before the renovation, the hospital had been spending around €1.6 million every year on energy. Now the total power bill will be halved, which means that the renovation costs will be recovered within 14 years.

The project was financed by a combination of private and public investment through an ESCO (Energy Saving Company) with 65% private funds and 35% public capital from the Croatian energy efficiency fund. And with the hospital recently celebrating its 50<sup>th</sup> birthday, the renovation could not have come at a better time.

<https://www.youtube.com/watch?v=ytrERXGfQPM&feature=youtu.be>





# Case - Myhrerenga Borettslag

## Upgraded house quality and nearly zero energy house standard

Myhrerenga Borettslag was built in 1968 to 1970, and consists of seven identical blocks in 3 floors with a total of 168 2- and 3- bedroom apartments.

The blocks were considered suitable for a passive house renovation, which the cooperative started in spring 2011.

Like many other apartment buildings from the same period, the Myhrerenga buildings were poorly insulated and drafty with thermal bridges in story partitions.

In addition, various air leaks were discovered, extensive exterior damage, moisture under balconies and rot in window frames.

A comprehensive and necessary facade renovation was conducted.

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# Case - Myhrerenga Borettslag

After the renovation, calculations show a 70% reduction in energy consumption from 275kWh / m<sup>2</sup> per year to 80 kWh / m<sup>2</sup> per year.

The goal of the renovation was not to reach a fully passive standard, but to use all passive components in a cost effective manner.

SINTEF calculated that although a renovation with passive components would have a much higher investment cost, the residents would get a smaller rent increase than if they had chosen a more traditional facade renovation.

The project shows that the typical apartment buildings from the 1960s-1970s are well suited to be upgraded to low-energy housing.

Residents were after the renovation interviewed about the results and noted that they were:

- Very satisfied with the aesthetic result of the upgrade
- Happy about the extended balconies
- Very pleased with indoor air quality and temperature, even during winter



The renovation of Myhrerenga condominium was a pilot project realized in collaboration with SINTEF, Byggforsk, Husbanken og boligbyggelaget USBL.

# Questions?



# Thank you