

2nd Online Mini Workshops
Series

Renovation Wave in Action -
Sharing Experiences

4th Webinar

A Segment Focus: Renovating Schools

1st of July 2020
(09:30-10:45 CEST)
Via GoToMeeting

EurACE
THE EUROPEAN ALLIANCE OF COMPANIES
FOR ENERGY EFFICIENCY IN BUILDINGS



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Moderation and Guidance:



H el ene Sibileau
EuroACE Senior EU Affairs Manager

Guidance

- You are kindly asked to remain muted
- No cameras for the whole duration of the webinar
- Only speakers and moderator will stay unmuted
- A 20-25 minutes Q&A session will follow the main presentation
- Ahead of, and during, the Q&A session, questions will have to be sent to “**Everyone**” in the **GoToMeeting chat box**.
- Questions should be as concise as possible and specify to whom they are directed
- The moderator will group questions and then address them to the speakers
- If time does not allow to cover all questions, they will be forwarded to the speaker for later response
- The PowerPoint presentation and questions will be shared with you in due course

Introduction



Céline Carré
Vice-President of EuroACE

About EuroACE

14 Member Companies,
Cross-sector representation:



More than 220,000 employees

Over 1000 production facilities and
office locations in the EU



About EuroACE

Improving the energy efficiency of buildings and reducing their energy demand is the **most cost-effective** method of:

- Creating employment and securing economic growth
- Providing Europeans with comfortable and healthy homes
- Meeting carbon reduction targets
- Achieving energy security





RENOVATE EUROPE

- EU-wide political communications campaign
- Focuses exclusively on ambitious energy *renovation* of the building stock, motivating EU and national institutions to take action
- 38 partners, including 14 at national level
- High political support with the *Champions Together for Renovation*

#PrioritisePeople
#AccelerateRenovation



Why schools ?



Education
is the most
powerful
weapon
which you
can use to
change the
world.

- Nelson Mandela

Some figures about schools

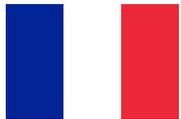


- ▶ 780,000 educational buildings in the EU
- ▶ Average of 1400m² per school
- ▶ 15 million pupils in pre-primary education
- ▶ 30 million pupils in primary education
- ▶ 19 million upper high school students

- ▶ 80% schools were built over 20 years ago
- ▶ Schools = 50% of local authorities building stock (=140 mio m²)
- ▶ Public buildings = 75% energy consumption of local authorities
- ▶ Primary schools : 30% energy consumption of local authorities
- ▶ Energy Consumption of schools : approx 14 TWh (2017)
- ▶ Example of upper higher schools (Auvergne):
 - Heating accounts for 3/4 of final energy consumption
 - each student emits 390 kg/CO₂/yr; costs €214 per year in energy bills



Average GDP
spending on
Education in
Europe : 4.6%





Example #1

Kindergarten Ciciban, Velika Gorica

- ▶ In Velika Gorica, signatory of Covenant of Mayors Signator (sustainable energy and action plan in 2011)
- ▶ Built in 1979, renovated in 2019
- ▶ 1,711 m²; 582 children; 16 full-time educational groups and special program groups; 104 employees
- ▶ Having turned to an eco-school, the school management saw energy renovation as essential to underpin the new ethos of the school
- ▶ ETICS system, roof replacement, airtightness, replacement of external windows, doors and lighting, new thermal heating, radiators, piping
- ▶ Energy savings after works reached 76%



Tatjana Karlovic Oslakovic: In 2018 the City rejoiced us with an energy renovation that provided us and our children with a healthier and safer environment (...). Our mission will continue to be to provide an environment where the child will feel happy, safe and protected."

Example #2

Primary school in Masano di Caravaggio



- ▶ School closed in 2014 due to anti-seismic inadequacy
- ▶ Deep energy retrofit and transformation in an exemplary building
- ▶ Optimal balance between energy efficiency, sustainability, safety and comfort.



Feel

- Achieved performance: energy balance of 55.05 kWh/m².yr
- “A2” Class reached, **from Class G (87% savings)**
- 431,95 kWh/m²/yr : average consumption of schools in Lombardy

Breathe

- Constant supply of clean, fresh air and a balanced temperature.
- Actively purifies the air, removing VOCs

Hear

- Protection from external noise (eg. high-speed railway line)
- Optimum sound insulation to improve speech intelligibility

See

- High transparency and brightness
- Correct diffusion of natural light



Example #2

Primary school in Masano di Caravaggio



What about accelerating school renovation ?

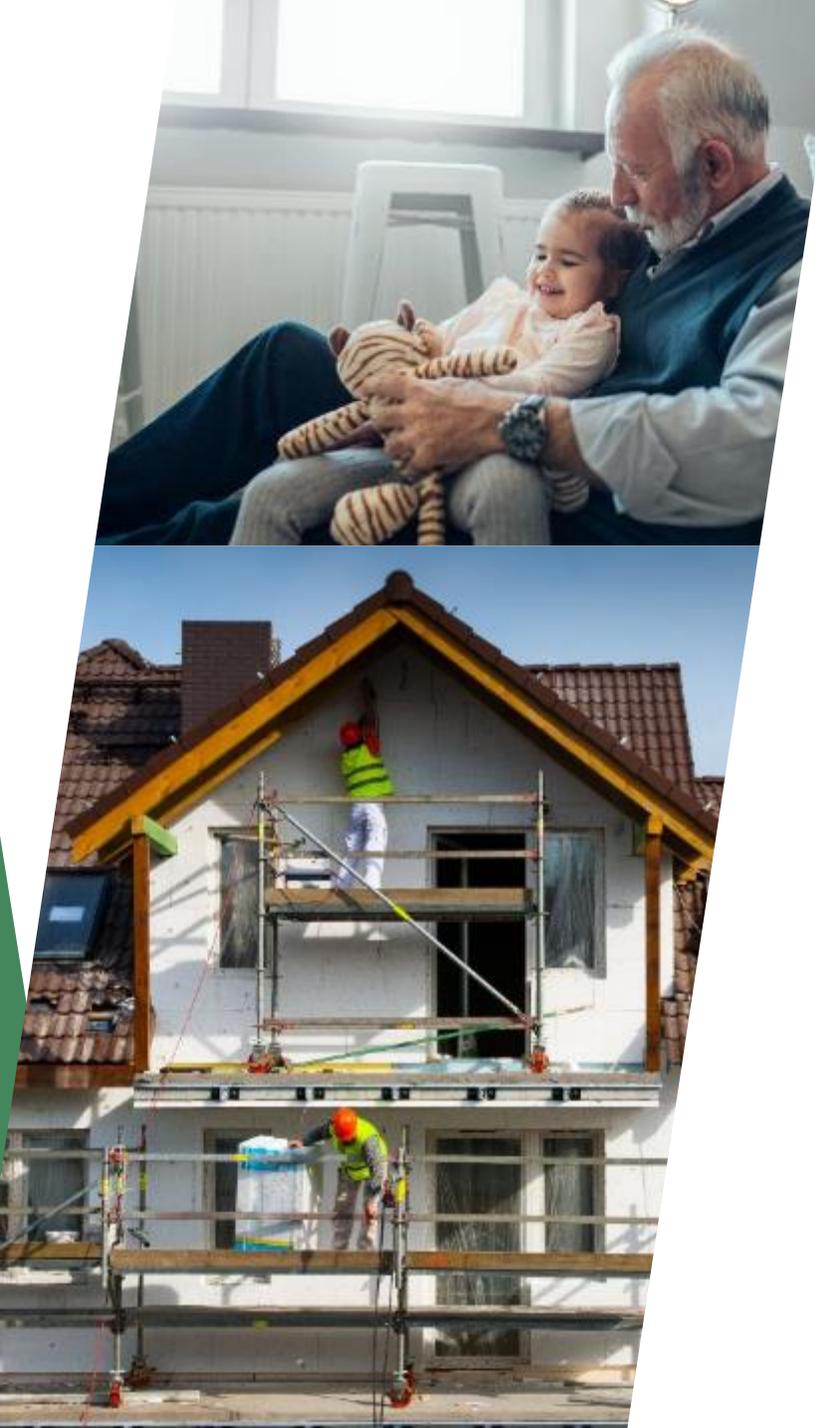
- ▶ EED art.5 : 3% renovation/year for *central* government public buildings => did not happen
- ▶ What level of renovation? Most projects deliver 10% to 30% savings (9-15 years)
- ▶ €300 bio investment needed to deeply renovate half of educational buildings (780K) in Europe (cf JDI)

This could support 5,4 mio jobs (€ 1mio => 18 jobs)

Renovation Wave : What's next for schools ?

- ▶ Priorisation of school renovation in LTRS, city plans ?
- ▶ Dedicated EU funding stream to ease access and speed ?
- ▶ Supporting market maturity / aggregators ?
- ▶ Use of Energy Performance Contracting ?
- ▶ Internal capacity of public authorities ?
- ▶ Ambition vs. lock-in effect ?
- ▶ Holistic approach : energy/climate + health + educational ?





Today's discussion

We will discuss about schools and their renovation, more specifically:

- The benefits of renovating schools and educational buildings at large
 - The barriers in doing so, and especially on the side of the stakeholders' engagement
- What should be the incentives that could trigger the full potential of this building segment ahead of the Renovation Wave Initiative

Setting the scene on the upcoming Renovation Wave



Karlis Goldstein

Energy Efficiency Adviser, Cabinet of Commissioner Kadri
Simson (European Commission)

The benefits of Renovating Schools



Mariangiola Fabbri
Head of Research, BPIE



The benefits of renovating schools

Quantifying the benefits of energy renovation investments in schools

Mariangiola Fabbri, Head of Research

EuroAce Webinar, 1 July 2020



Why is this important?



90 million

students spend their days
in educational buildings.



80 million

workers spend 8 hours
each weekday in an office.



90 million

patients spend on average
7.6 days per year in hospitals.

- **1/3** of European employees work in an office
- Companies spend around **90%** of their operating costs on staff
- Research shows that poor indoor environmental quality can significantly affect occupants' health, attendance, concentration and working or learning performance
- Why are companies and public authorities not reaping the benefits they could reach by providing better buildings?

Our Hypothesis: Because they cannot quantify & include them in comparison to other investment options. This investment comparison is commonly facilitated by cost-benefit analysis.

Literature Selection

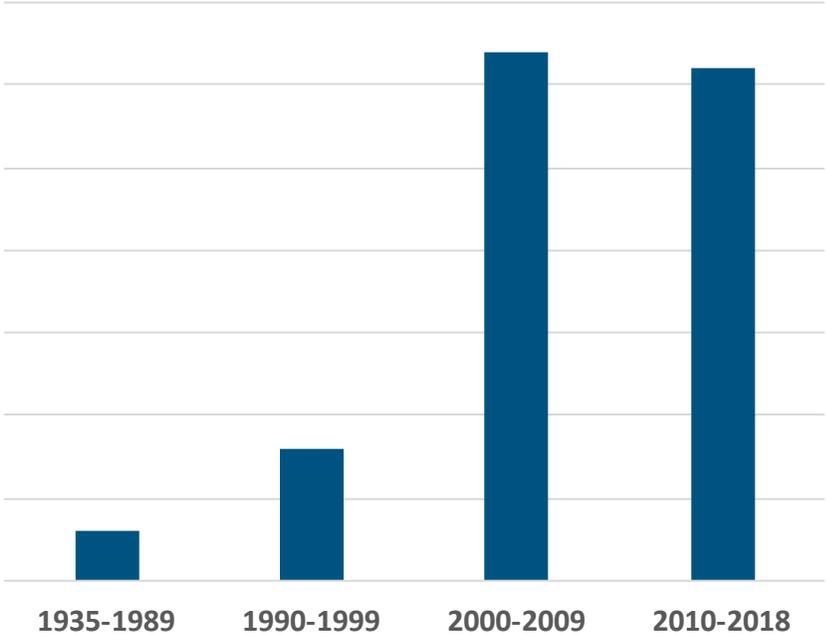


We have gathered over 400 relevant studies, including:

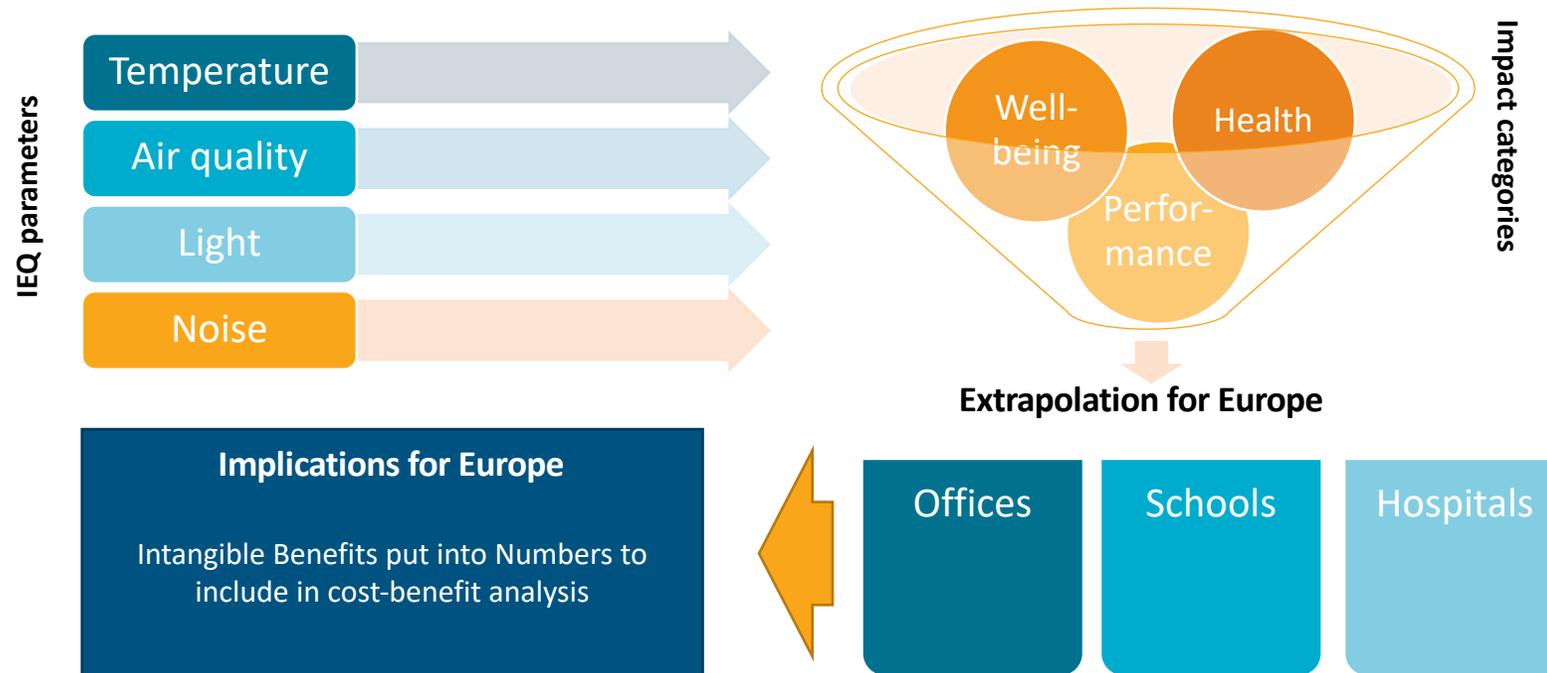
- 73 Studies have quantified the impact of better indoor environment
- Selection criteria include the measurement of an indoor environment parameter and the testing of performance or health, which excludes self assessment

We backed up this approach with interviews and reviews by leading experts and stakeholders.

Year of publication



Methodological Approach



Poor IEQ affects students' health, attendance, concentration and learning performance

- Every 1°C reduction in overheating increases students' learning performance by **2.3 %**
- For every 1 litre per second per person (l/s/p) increase in the ventilation rate up to 15 l/s/p, academic performance increases by **1%**
- Every 100ppm decrease in CO₂ concentration is associated with a **0.5%** decrease in illness-related absence from schools
- Every 100 lux in improved lighting in schools is associated with a **2.9%** increase in educational performance
- Better daylight is associated with a **9% to 18%** increase in educational performance

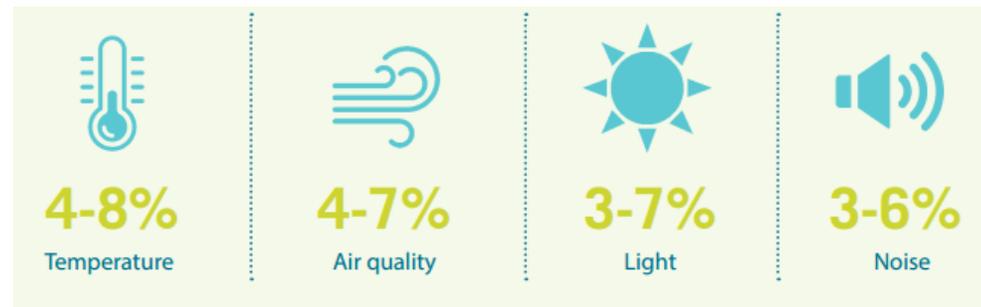


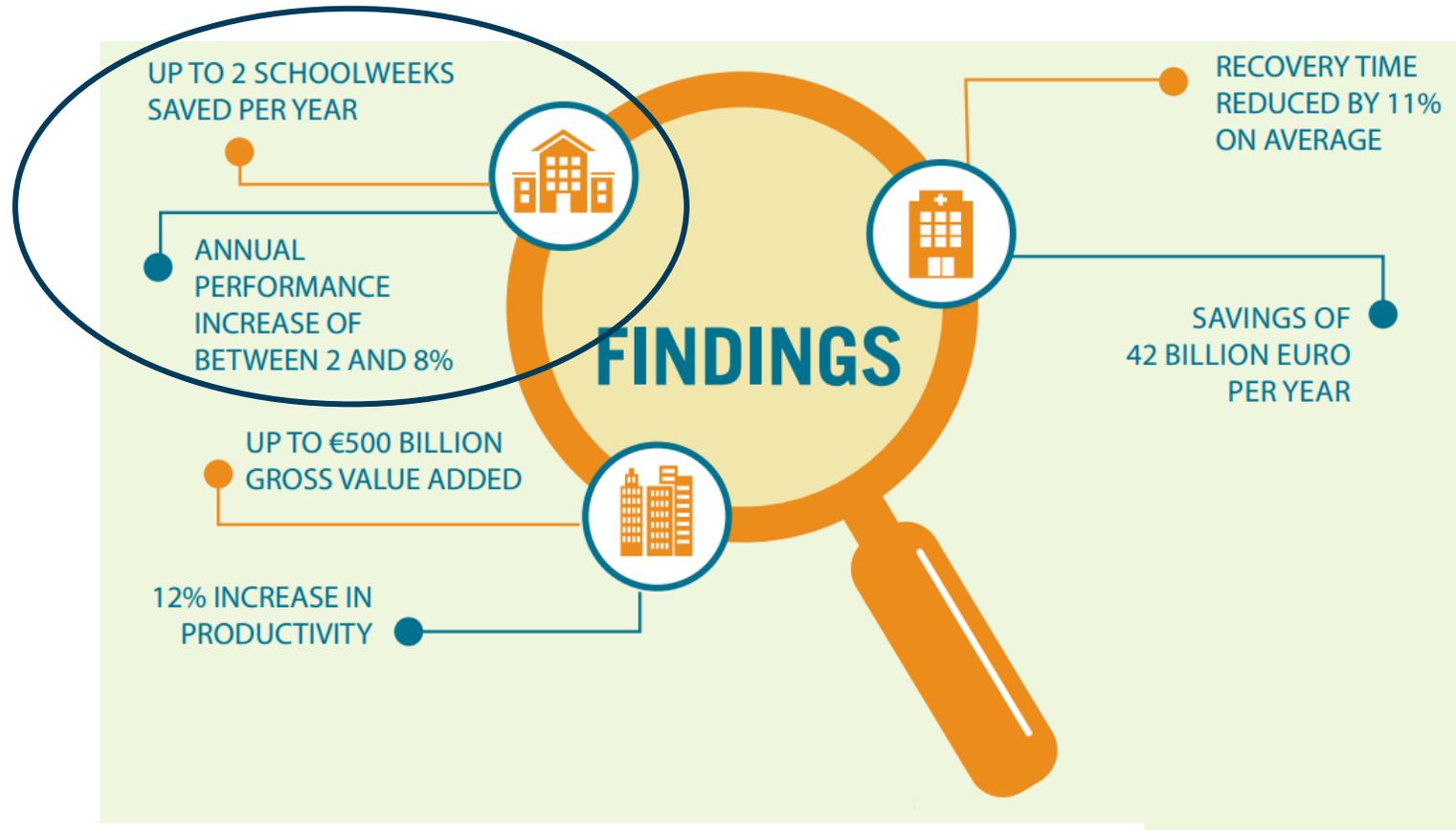
Schools

- Children are more vulnerable
- Maximise all dimensions of IEQ
- Better school buildings bring about better student results.
- Alleviate e.g. asthma or allergies and improve performance:



- Attention
- Concentration
- Memory abilities
- Readability
- Motivation





- EC leading role to create enabling framework to support building renovation in Europe.
- **Align health and energy policy agenda** – post Covid-19 crucial to recover and repair by exploiting the positive synergies between energy and health policies, e.g.
 - Integrate indicators for healthy buildings in data collection system
 - Cost-optimality: value of health, well-being and performance benefits count alongside energy cost savings when calculating minimum energy performance requirements.
- Ensure ambitious implementation of EPBD: wider benefits of building renovations in LTRS to be accounted for. E.g. Reduced healthcare and social services costs should be considered in estimation of wider benefits



Plan for recovery

- **Next Generation EU:** MS opportunity to fund renovations requiring higher upfront costs and with longer payback times but bringing high societal benefits (e.g. schools and hospitals).
- **Engage in renovation of public building stock** to stimulate market transformation towards zero-carbon buildings, promote best practice and raise awareness of state-of-the-art renovations:
 - Expand and strengthen **obligation to renovate central government buildings to all public buildings**, including schools and hospitals.
 - Support public authorities in using **ESCO model** as a key tool to renovate schools, including through technical assistance.



Building 4 People: Quantifying the benefits of energy renovation investments in schools, offices and hospitals

METHODOLOGY AND RESULTS



Building 4 People: Building the business case for better office, school and hospital buildings in Europe

One third of European employees work in an office for an average of 8 hours a day while most companies spend 98% of their operating costs on people, including salaries and benefits. Investing in building renovation can cut energy costs and improve the environment, though companies could reap the largest benefits by providing a comfortable, healthy and well-designed work space to improve employee performance, decrease staff turnover and absenteeism and thus boost business competitiveness.

Our analysis reveals that a holistic people-centric renovation of a typical office can lead to up to a 12% increase in employee productivity. At a European scale, that could be worth up to €500 billion annually.

PEOPLE-CENTRIC OFFICES = HEALTHIER AND MORE PRODUCTIVE EMPLOYEES

- 7-12%** Maintaining ideal thermal conditions can increase productivity by 7-12%, worth up to €6,500 p.a. on average per employees.
- 3-6%** Plenty of fresh, clean air makes for a healthier working environment, boosting productivity by 3-6%, worth up to €1,500 p.a. per employee.
- 3-6%** Getting lighting right - including through good access to daylight and appropriate levels and quality of electric light - means 3-6% more output per employee, typically worth up to €1,200 p.a.
- 3-4%** Better acoustics, particularly in open-plan offices, where distractions and noise are common, can improve productivity by 3-4%, worth up to €1,000 p.a. on average for each person.

On behalf of Buildings 2030, BPIE undertook extensive research into both published and unpublished studies which quantified one or more benefits from building renovations that improved the indoor environment in offices, schools or hospitals. For details of the methodology, including all reference sources, please refer to the accompanying report 'Building 4 People'.



AN ACTION PLAN FOR THE RENOVATION WAVE: COLLECTIVELY ACHIEVING SUSTAINABLE BUILDINGS IN EUROPE

IN A CLIMATE-NEUTRAL EUROPE, BUILDINGS WILL BE...

HEALTHY AND WELL-BEING
PART OF THE ENERGY SYSTEM
ENERGY EFFICIENT
CIRCULAR ECONOMY
FOSSIL FUEL FREE
RESILIENT TO CLIMATE CHANGE



Building 4 People: Quantifying the impact of a better indoor environment in schools, offices and hospitals

Across Europe, 90 million children and young people spend their weekdays in schools, colleges and universities. More than one in three of the working population are office-based. And every year, 90 million patients spend more than a week on average in hospitals. Yet the impact of the indoor environment on people's health, well-being and performance is not well understood or adequately addressed in EU policy.

EU climate and energy goals require us to accelerate the renovation of Europe's ageing building stock, most of which will still be standing in 2050 and beyond. Given nearly zero energy levels. Crucially, these renovations need to also improve indoor environmental quality in order to:

- Boost labour force productivity** by up to 12%, worth up to €500 billion a year across the EU.
- Accelerate educational performance** of students by up to two weeks a year.
- Reduce the average length of stay in hospitals** by 11% (around one day) potentially saving the European health sector €42 billion annually.
- Cut CO₂ emissions, reduce energy bills, alleviate fuel poverty, improve energy security and boost innovation** in the construction industry.

We spend 98% of our time indoors* - at home, in schools, at work, and occasionally working treatment in hospital. Office workers, patients and students are often exposed to overheating during increasingly frequent summer heatwaves, draught conditions caused by leaking windows, inadequate insulation or poorly controlled ventilation, poor lighting or excessive noise. The all has a negative impact on European health, well-being and performance.

*Peters, N. & al. (2018). 'The indoor climate which patients want: results of a patient survey and environmental guidelines', p. 17, Fig. 2.10, p. 22.



Thank you...

Mariangiola Fabbri

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NEWSLETTER

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“How to engage with education stakeholders and plan a renovation strategy for schools”

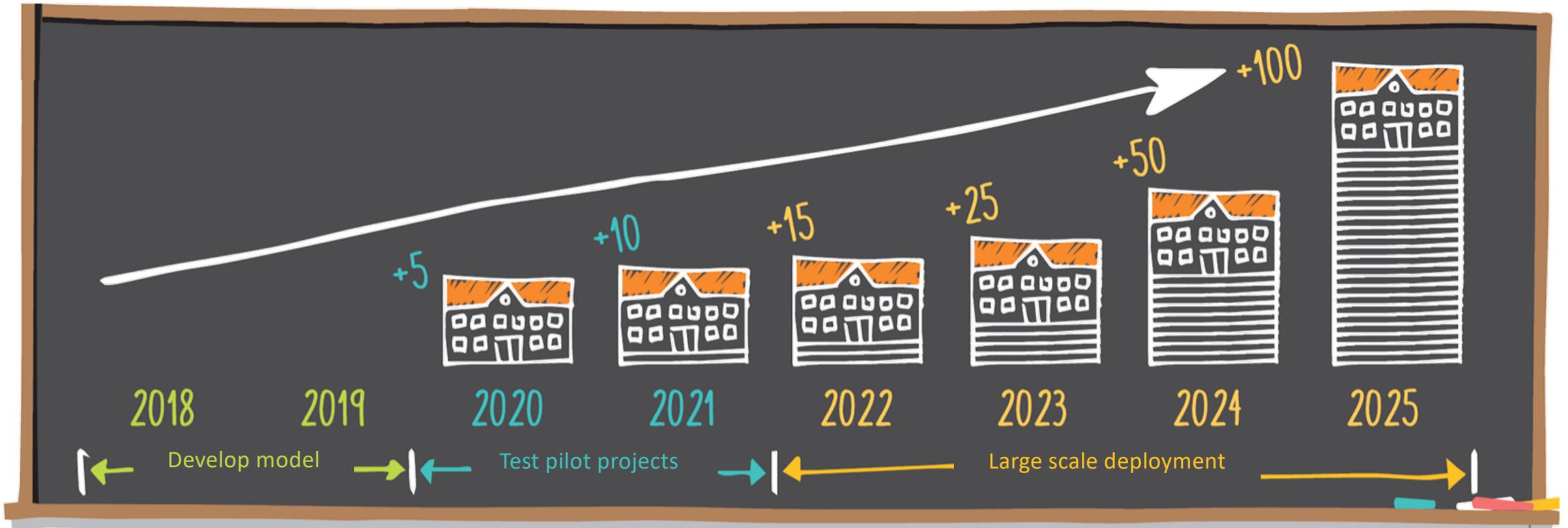


Quentin Jossen
Consultant, CLIMACT

EuroACE WEBINAR ON SCHOOLS - JULY 1ST 2020

How to deep renovate 3000 schools in Belgium by 2050?

We are at the start of a long journey towards better schools for our children & teachers and less impact on our planet



Yearly school renovations to trigger in Belgium corresponding to 3%/year from 2025 onwards

Deep renovation goes well beyond energy efficiency when you talk with schools directors

②



Health, safety and comfort

③



Sustainability

①



Today and tomorrow's educational needs

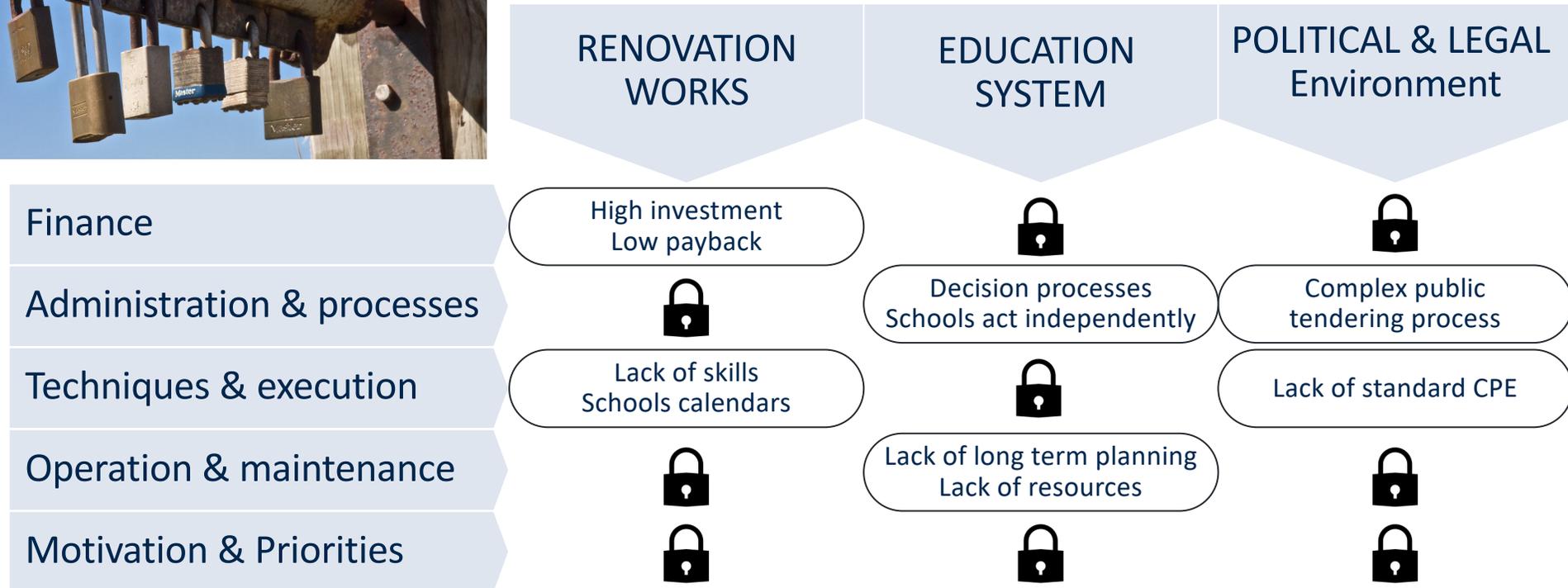


④



Locally integrated

There are multiple hurdles to school renovation because of the complexity of the sector and the many actors involved





- 150 people interviewed
- 50 qualified participants
- 5h of thinking and co-creation
- Hundreds of ideas
- Meetings & networking
- ... a collective desire to get back into action



We engaged stakeholders in joint discussions on the barriers and we co-elaborated an action plan

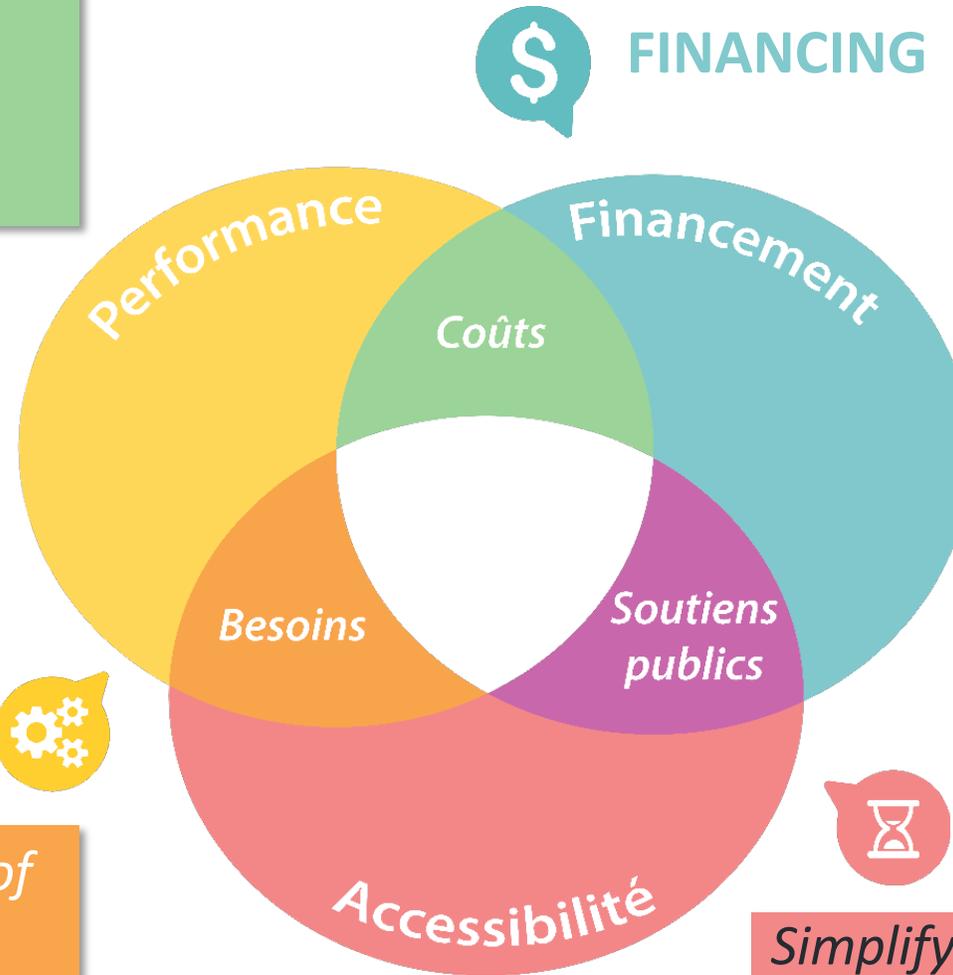
Reduce the costs of renovation and use of a school building

 **FINANCING**

Optimize the management of capital and facilitate access to external financing

Increase and facilitate access to public support & optimize building management

 **PROCEDURES**
Simplify procedures and equip schools to facilitate access



Ensure the multi-criteria performance of proposed solutions

TECHNIQUES



Identify and take the needs of the school into account

Our stakeholder journey defines a new shared 2025 vision for school renovation with 4 key elements



1

A common **vision** and a global **real estate strategy** is needed

2

'**Infrastructure Manager**' becomes a key function within each school

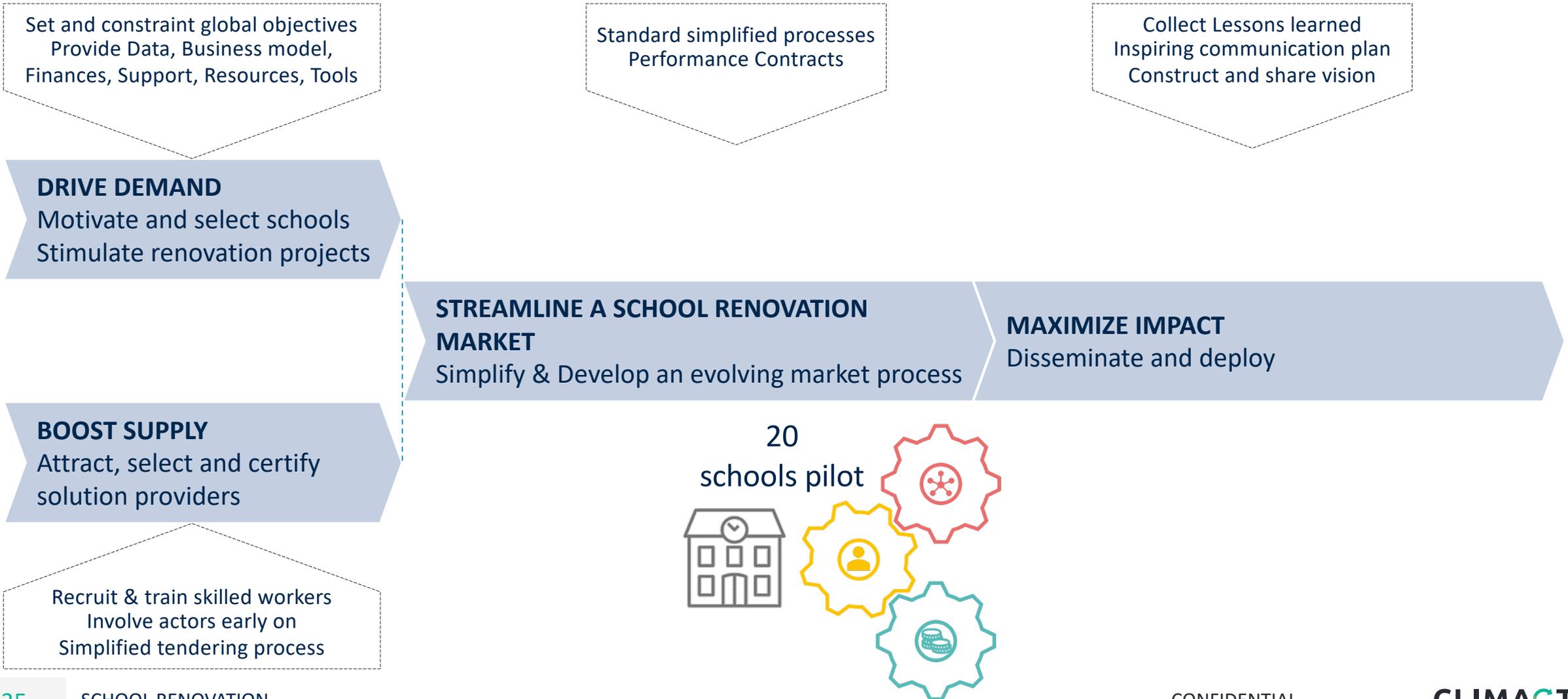
3

External **coaches** and standard **tools** are needed to support the IM in the entire process

4

Existing and **innovative financing** methods should be combined to structure the investments

The overall plan is to create and facilitate an attractive Schools Renovation Market, connecting public and private interests



Thank you.

CLIMACT

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Reactions from the European Commission



Karlis Goldstein

Energy Efficiency Adviser, Cabinet of Commissioner Kadri
Simson (European Commission)

Q&A Session

Please be patient while
Helene Sibileau reads your
questions to the speaker



Conclusions



Céline Carré
Vice-President of EuroACE



Thank You For Your Attention!

@_EuroACE

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