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

EuroACE
THE EUROPEAN ALLIANCE OF COMPANIES
FOR ENERGY EFFICIENCY IN BUILDINGS

For more information:
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Moderation and Guidance:

Hélène 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
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
• 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.

- 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
- Constant supply of clean, fresh air and a balanced temperature.
- Actively purifies the air, removing VOCs
- Protection from external noise (eg. high-speed railway line)
- Optimum sound insulation to improve speech intelligibility
- 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)

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?

- 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.
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.
Methodological Approach

**APPROACH**

- Identifying and linking beneficial impacts of Indoor Environmental Quality on people
- Quantifying health, educational and performance benefits
- Extrapolating quantified benefits to Europe
- Putting a monetary value on the benefits

**IEQ parameters**

- Temperature
- Air quality
- Light
- Noise

**Impact categories**

- Well-being
- Health
- Performance

**Extrapolation for Europe**

**Implications for Europe**

Intangible Benefits put into Numbers to include in cost-benefit analysis

**Offices**  
**Schools**  
**Hospitals**
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

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Temperature</td>
<td>4-8%</td>
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<tr>
<td>Air quality</td>
<td>4-7%</td>
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<tr>
<td>Light</td>
<td>3-7%</td>
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<tr>
<td>Noise</td>
<td>3-6%</td>
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FINDINGS

- UP TO 2 SCHOOLWEEKS SAVED PER YEAR
- ANNUAL PERFORMANCE INCREASE OF BETWEEN 2 AND 8%
- UP TO €500 BILLION GROSS VALUE ADDED
- 12% INCREASE IN PRODUCTIVITY
- RECOVERY TIME REDUCED BY 11% ON AVERAGE
- SAVINGS OF 42 BILLION EURO PER YEAR
Renovation Wave

• 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.
Thank you...

Mariangiola Fabbri
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WWW.BPIE.EU
“How to engage with education stakeholders and plan a renovation strategy for schools”

Quentin Jossen
Consultant, CLIMACT
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.
There are multiple hurdles to school renovation because of the complexity of the sector and the many actors involved.

<table>
<thead>
<tr>
<th>Finance</th>
<th>RENOVATION WORKS</th>
<th>EDUCATION SYSTEM</th>
<th>POLITICAL &amp; LEGAL Environment</th>
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</thead>
<tbody>
<tr>
<td>Administration &amp; processes</td>
<td>High investment</td>
<td>Decision processes</td>
<td>Complex public tendering process</td>
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<td>Techniques &amp; execution</td>
<td>Low payback</td>
<td>Schools act independently</td>
<td>Lack of standard CPE</td>
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<td>Operation &amp; maintenance</td>
<td>Lack of skills</td>
<td>Lack of long term planning</td>
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<td>Motivation &amp; Priorities</td>
<td>Schools calendars</td>
<td>Lack of resources</td>
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</table>
- 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**
- **Optimize the management of capital and facilitate access to external financing**
- **Increase and facilitate access to public support & optimize building management**
- **Simplify procedures and equip schools to facilitate access**
- **Ensure the multi-criteria performance of proposed solutions**
- **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.

**DRIVE DEMAND**
- Motivate and select schools
- Stimulate renovation projects

**BOOST SUPPLY**
- Attract, select and certify solution providers
- Recruit & train skilled workers
- Involve actors early on
- Simplified tendering process

**STREAMLINE A SCHOOL RENOVATION MARKET**
- Simplify & Develop an evolving market process

**MAXIMIZE IMPACT**
- Disseminate and deploy
- Collect Lessons learned
- Inspiring communication plan
- Construct and share vision

Set and constraint global objectives
- Provide Data, Business model, Finances, Support, Resources, Tools

Standard simplified processes
- Performance Contracts

20 schools pilot
Thank you.

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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 Sibilleau reads your questions to the speaker
Conclusions

Céline Carré
Vice-President of EuroACE
Thank You For Your Attention!

@_EuroACE
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