

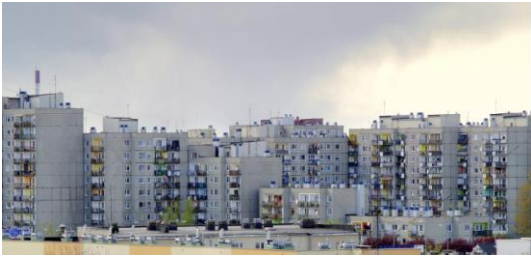


# Decarbonisation and deep energy renovation of buildings

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# Justification



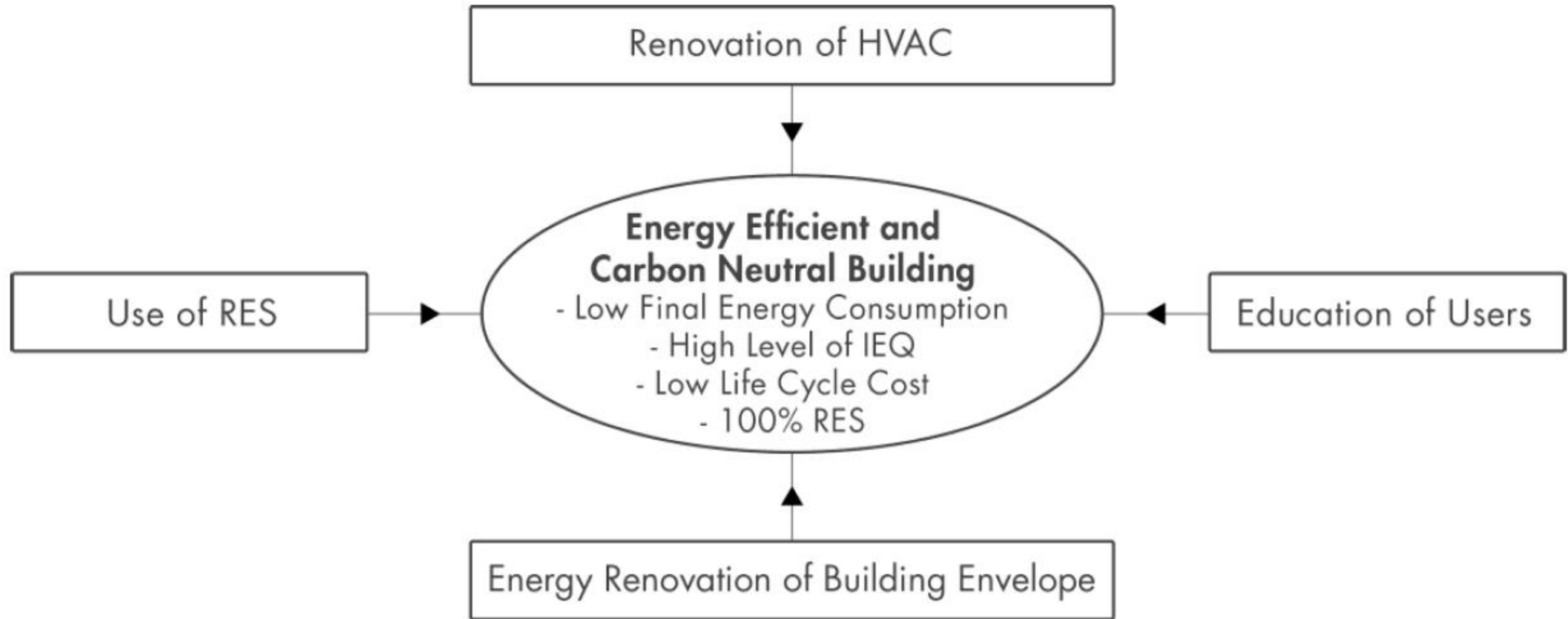
- EU communications on Green Deal, Renovation Wave and REPowerEU
- decarbonisation of the EU building stock requires energy renovation at a large scale: almost 75% of the EU's building stock is inefficient according to current building standards, and 85-95% of the buildings that exist today will still be standing in 2050.

However, there are numerous barriers stand in the way of higher renovation rates and decarbonisation of EU building stock, such as:

- the benefits of renovation (new technologies and practical knowhow),
- lack of trust in the actual energy savings that renovation will achieve,
- lack of technical and cost efficient concepts for decarbonisation of building stock.



# Decarbonisation and deep energy renovation of buildings- *A holistic approach*



- largely focus on building envelope energy renovation...
- BUT ... widely applicable modernisations in HVAC systems were not addressed in detail...



# Step 1 was already made



NO. 32 - 2022

Federation of European Heating, Ventilation and Air Conditioning Associations

- 11 chapters
- 114 pages
- 184 references

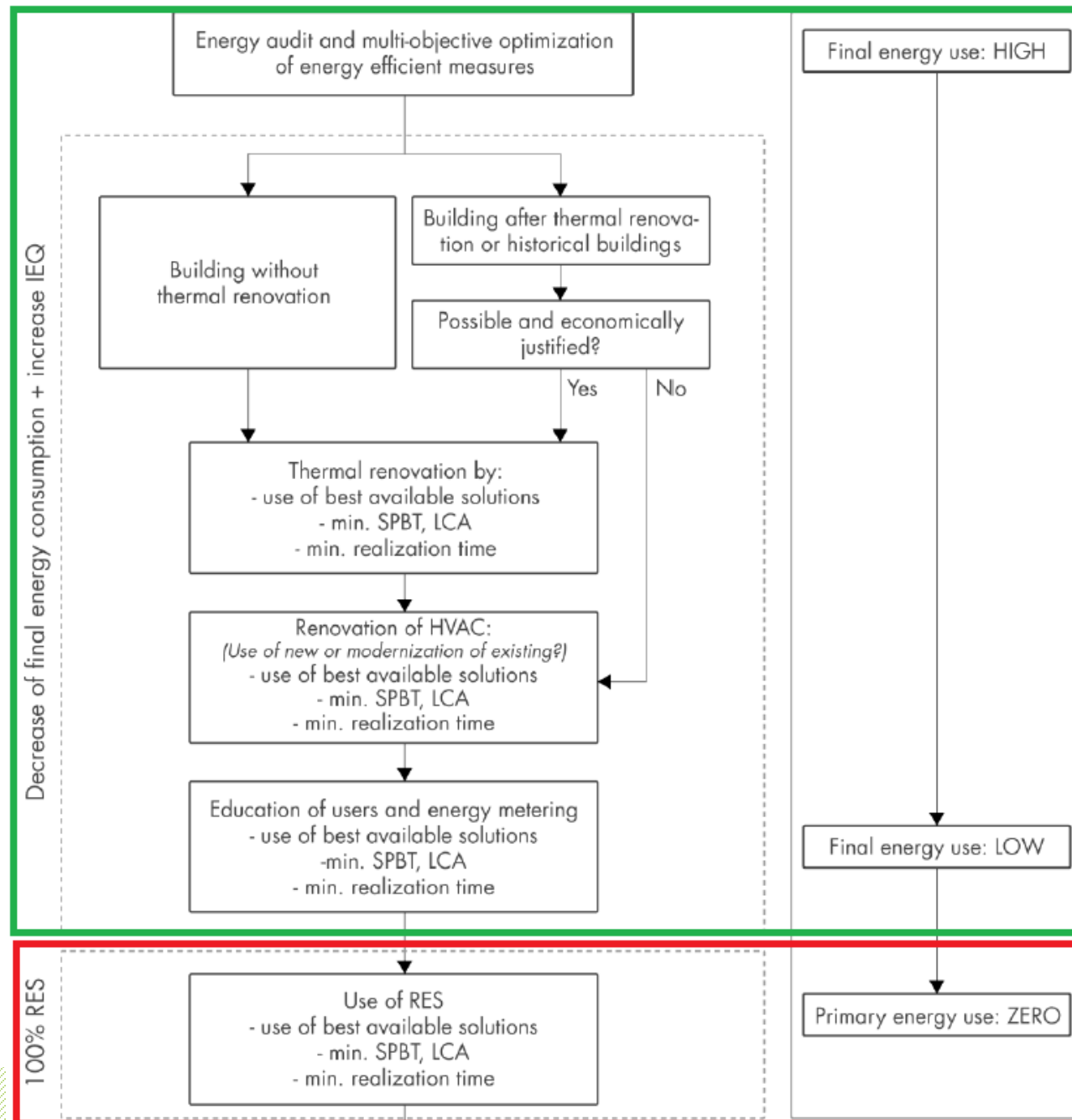
PREFACE

LIST OF ABBREVIATIONS

1. INTRODUCTION
2. DEEP RENOVATION OF EXISTING BUILDINGS - HOLISTIC APPROACH
3. ENERGY CONSUMPTION IN BUILDINGS
4. CHARACTERISTIC OF GENERAL METHODOLOGY OF FIELD STUDIES
5. BUILDING ENVELOPE
6. VENTILATION SYSTEMS AND HEAT RECOVERY
7. HEATING/COOLING SOURCES AND MAIN CONTROL SYSTEMS
8. HEATING SYSTEMS
9. DOMESTIC HOT WATER SYSTEM (DHW)
10. SPACE COOLING SYSTEMS
11. EDUCATING THE OCCUPANTS

REFERENCES





## STEP 1

## STEP 2

# Preferred measures by the managers of existing buildings

- Easy implementation within the existing building and installed HVAC systems.
- Minimal occupant disturbance during implementation (**short implementation time in existing buildings**) and subsequent operation for users and property managers.
- **Short payback time** for investment costs.
- High potential for **replicability** to other buildings and widespread use (scale effect).

# Main objectives of GB no.32 as guidelines for step 1

1. Holistic and widely applicable concepts for the renovation of existing buildings that underline the critical role of HVAC professionals in the process.
2. Good practices that are widely applicable and have been validated and demonstrated by proven practices during field studies
3. Practical guidelines applicable to different geographical locations and climate zones. The elaborated HVAC solutions will apply to different renovation concepts that may be specified by various renovation grants.





# Step 2: NEW REHVA Task Force on Decarbonisation of buildings for HVAC professionals

# Task force members (14 experts)

Title	Full name	Affiliations
Task Force co-chair	Tomasz CHOLEWA (TCH)	Lublin University of Technology, PZITS
Task Force co-chair	Cristiana CROITORU (CC)	Technical University of Civil Engineering of Bucharest
Member	<u>Lukasz Amanowicz</u> (LA)	<u>Poznań University of Technology</u> , PZITS
Member	Francesca Romana D'AMBROSIO (FD)	University of Salerno
Member	<u>Risto KOSONEN</u> (RK)	<u>Aalto Univeristy</u>
Member	<u>Michal KRAJČIK</u> (MK)	<u>Slovak University of Technology</u>
Member	<u>Jarek KURNITSKI</u> (JK)	<u>Tallinn University of Technology</u>
Member	<u>Catalin LUNGU</u> (CL)	REHVA
Member	<u>Livio MAZZARELLA</u> (LM)	<u>Politecnico di Milano</u>
Member	<u>Ilinca NASTASE</u> (IN)	<u>Technical University of Civil Engineering of Bucharest</u>
Member	<u>Robert Sekret</u> (RS)	<u>Czestochowa University of Technology</u> , PZITS
Member	<u>Christian Schauer</u> (CS)	<u>Viega</u>
Member	<u>Alicja SIUTA-OLCHA</u> (ASO)	<u>Lublin University of Technology</u> , PZITS
Member	<u>Marija TODOROVIC</u> (MT)	<u>AESS (Academy of Engineering Sciences of Serbia)</u> , Belgrade

# TF planned outcomes

- report on shift from natural gas in buildings entitled “Replacement of gas boilers with heat pumps, district heating and hybrid solutions” (**planned publication: 12.2022**)
- reports (numbers depending on the need of market and EU and/or global situation in this regard)
- REHVA Guidebook - a consensus document on engineering practice related to decarbonisation of buildings for HVAC professionals (**planned publication: end of 2024**).

# Report on the shift from natural gas in buildings *- preliminary Table of Content*

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2. LOW CARBON ENERGY SOURCES AVAILABLE AT URBAN LEVEL	
3. TYPICAL BUILDING SERVICES SYSTEMS SUPPLIED WITH NATURAL GAS IN BUILDINGS .....	
4. TECHNICAL SOLUTIONS TO SHIFT FROM NATURAL GAS IN BUILDINGS .....	
4.1. Power of new heat source .....	
4.2. Lowering the supply temperature of heating medium .....	
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4.5. Suggested Options for shift from natural gas in frame of building services systems in existing buildings .....	
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# Conclusions

- the important role of HVAC professionals in proces of decarbonisation and deep energy renovation of buildings must be clearly underlined by stakeholders
- step 1 (Energy efficient renovation of existing buildings) should be made as a first in decarbonisation proces in order to decrease final energy consumption
- step 2 (Use of RES) should be made after
- REHVA TF on Decarbonisation of buildings will try to assist HVAC professionals in this proces.

# Thank you !

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