

ASHRAE
Hellenic Chapter

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ENERGY IN BUILDINGS

EMEA 2024

Europe, the Middle East & Africa

FRIDAY - SATURDAY

NOVEMBER 22-23, 2024

@ 9:00-18:00

SESSIONS:

- SUSTAINABILITY
- HEALTH & SAFETY
- DECARBONIZATION
- TECHNICAL SOLUTIONS
- DIGITAL ENVIRONMENT
- POLICIES & LEGISLATION
- ENERGY EFFICIENCY FIRST
- RESILIENCE TO CLIMATE CRISIS

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**HEAT DECARBONISATION OF PUBLIC SECTOR HOUSING:
DEEP RETROFIT USING A RETROFIT PLAN METHODOLOGY**

HEAT DECARBONISATION OF PUBLIC SECTOR HOUSING: DEEP RETROFIT USING A RETROFIT PLAN METHODOLOGY

EVANGELIA MITSIAKOU

MArch Architectural Engineer, MSc Environmental Design of Buildings

Passivhaus Designer – PHPP Expert

Energy & Retrofit Assessor

Principal Sustainability Consultant @ AECOM, Greece

Sustainability & Decarbonisation Advisory, Building & Places

evangelia.mitsiakou@aecom.com



TRANSITION TOWARD A NET-ZERO CARBON FUTURE

Existing building stock -> a net-zero carbon future

technically feasible

ecological

economically viable

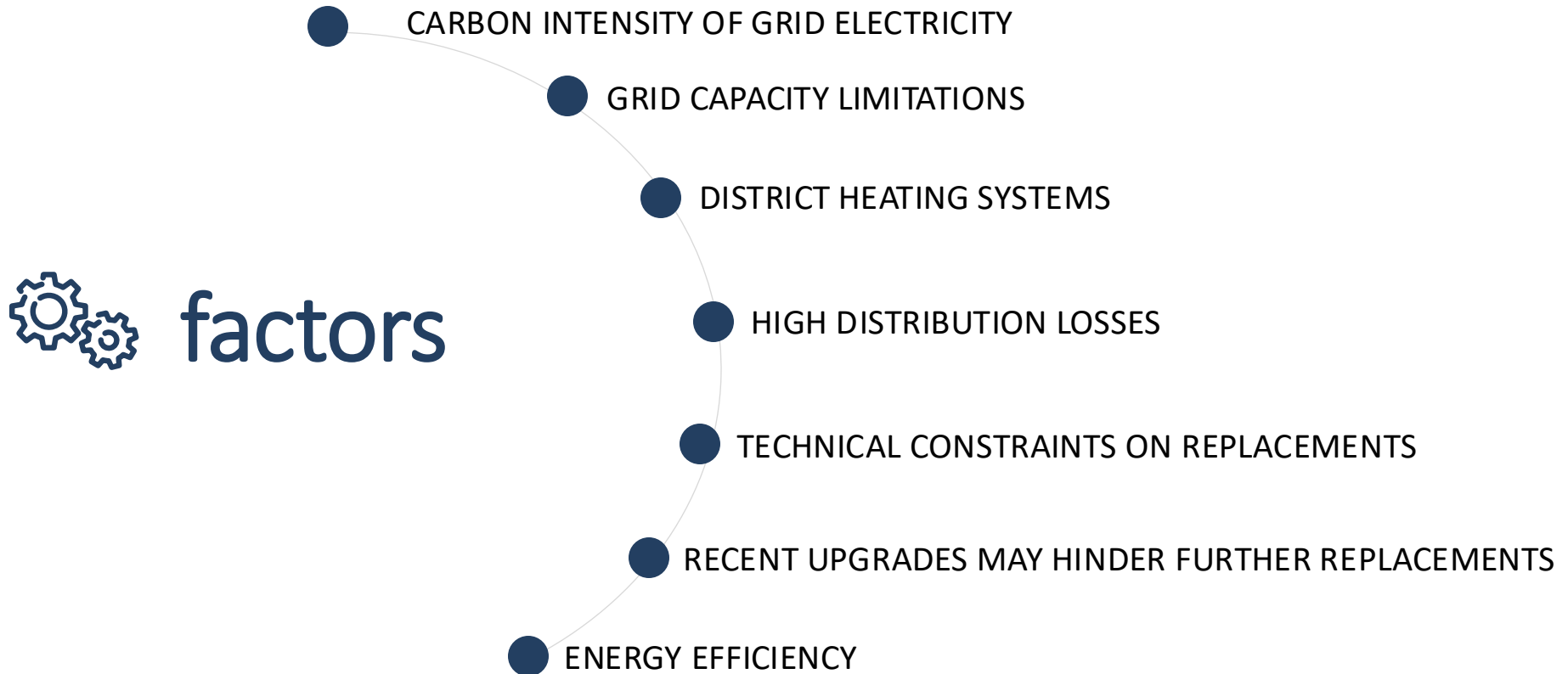
methods to retain and retrofit it.



minimise embodied energy



CRITICAL FACTORS RELATED TO LOW-CARBON HEATING

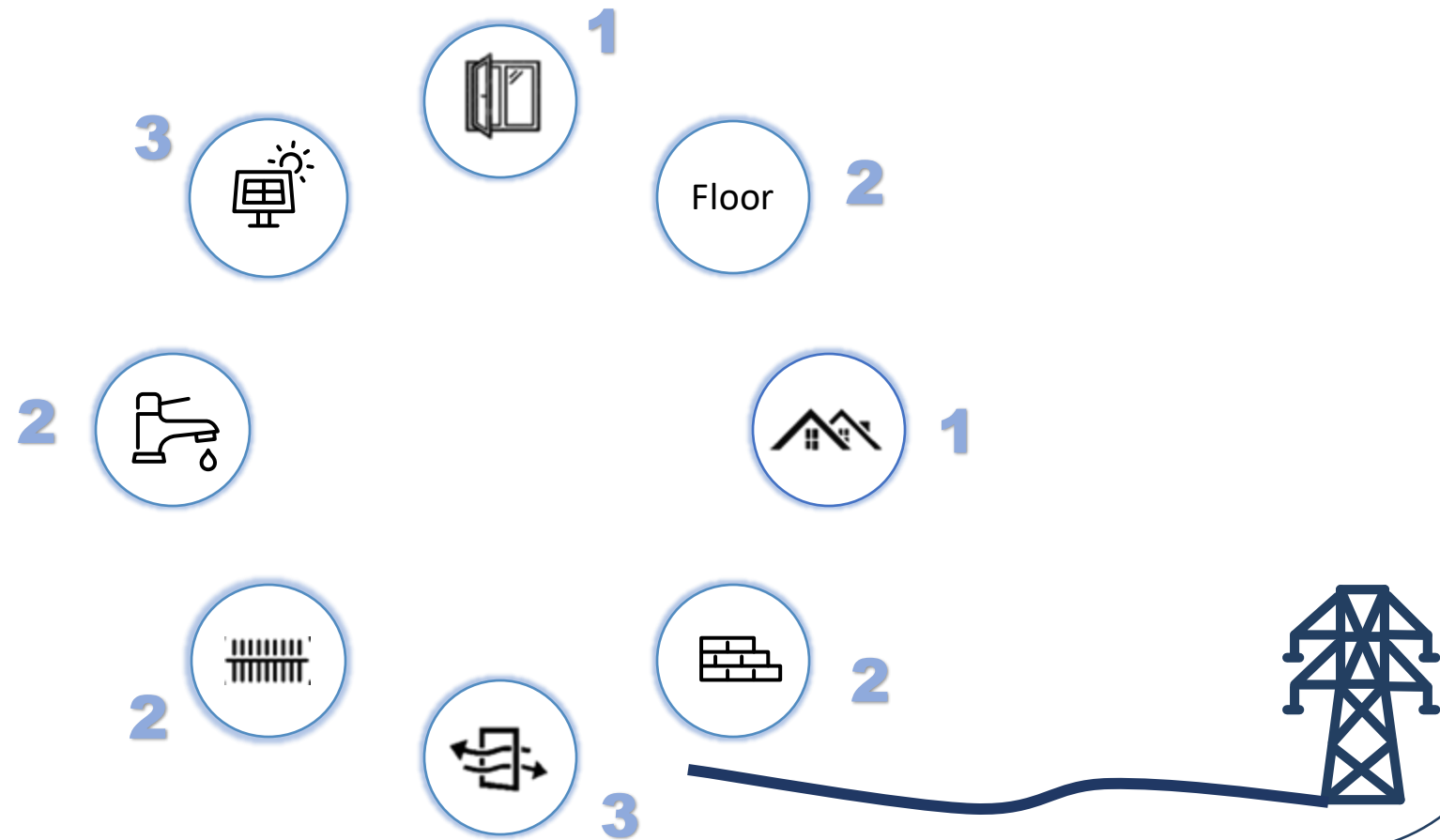


CRITICAL FACTORS RELATED TO LOW-CARBON HEATING

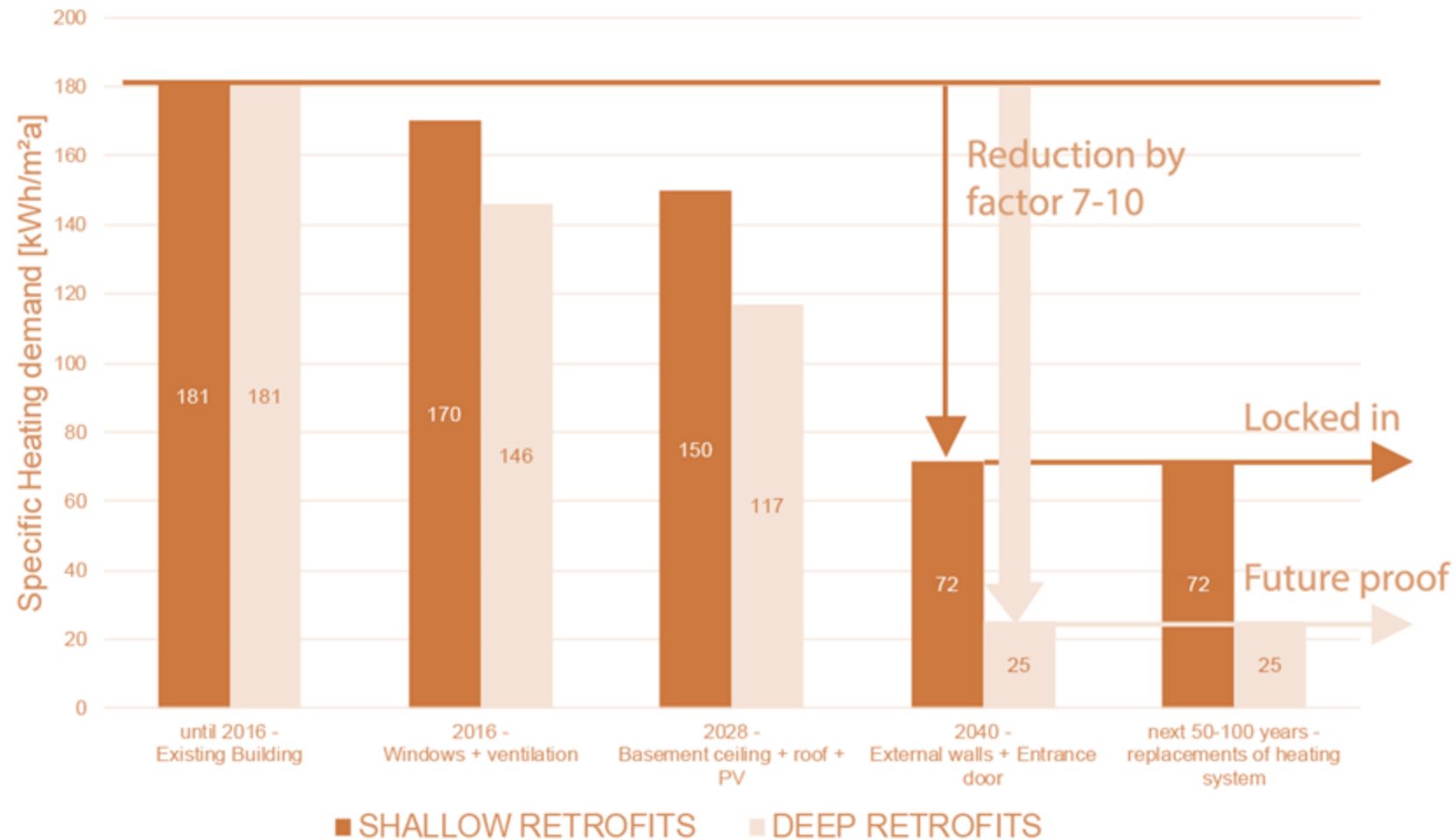
‘If we are going to have a chance of *electrifying everything*
and *running on renewables*,
we have to **reduce demand** and **shave the peaks**.’

Lloyd Alter

BEYOND RENOVATION: TRANSFORMING SPACES WITH ENERGY-EFFICIENT RETROFITS



DEEP vs SHALLOW RETROFITS



(SOURCE: EUROPHIT, PHI, 2016)

CASE STUDIES: 10 SOCIAL HOUSING BUILDINGS IN SOUTHEAST LONDON



Building 1



Building 2



Building 3



Building 4



Building 5



Building 6



Building 7



Building 10



Building 8



Building 9

DEFINING RETROFIT PLAN FOR DECARBONISING HEAT

Do nothing (worst case) – except wait for grid decarbonisation



Bronze – (no retrofit works) replace existing gas boilers only with new gas boilers



Silver – (some retrofit works to retain same bill costs for the tenants)



Gold (best case) – all retrofit works included to achieve 'LETI' target for space heating

Scenario A

Gas boilers only

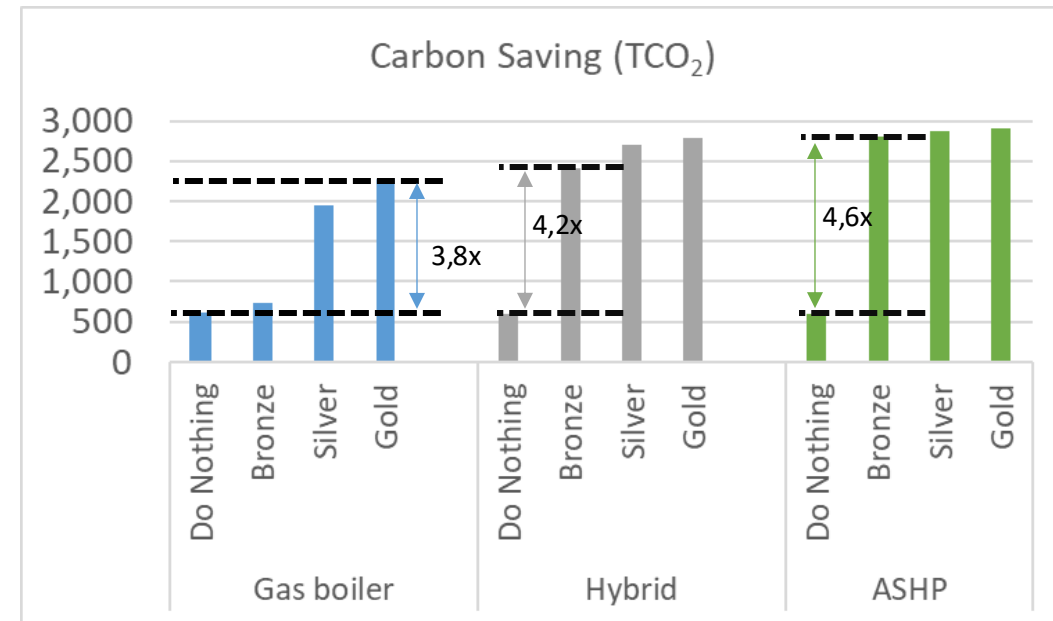
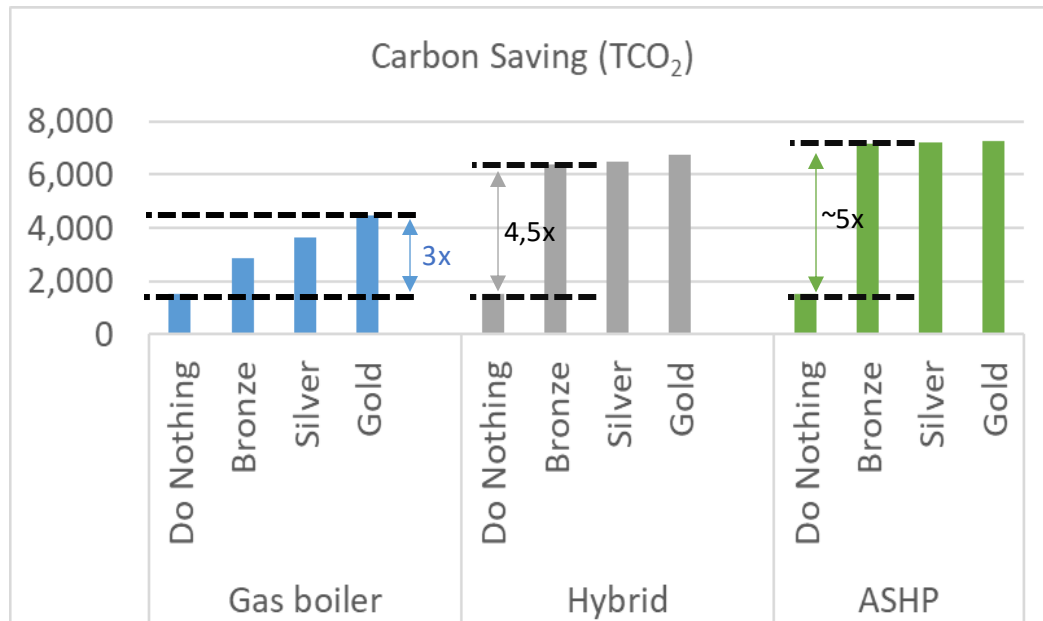
Scenario B

ASHP with back-up gas boilers

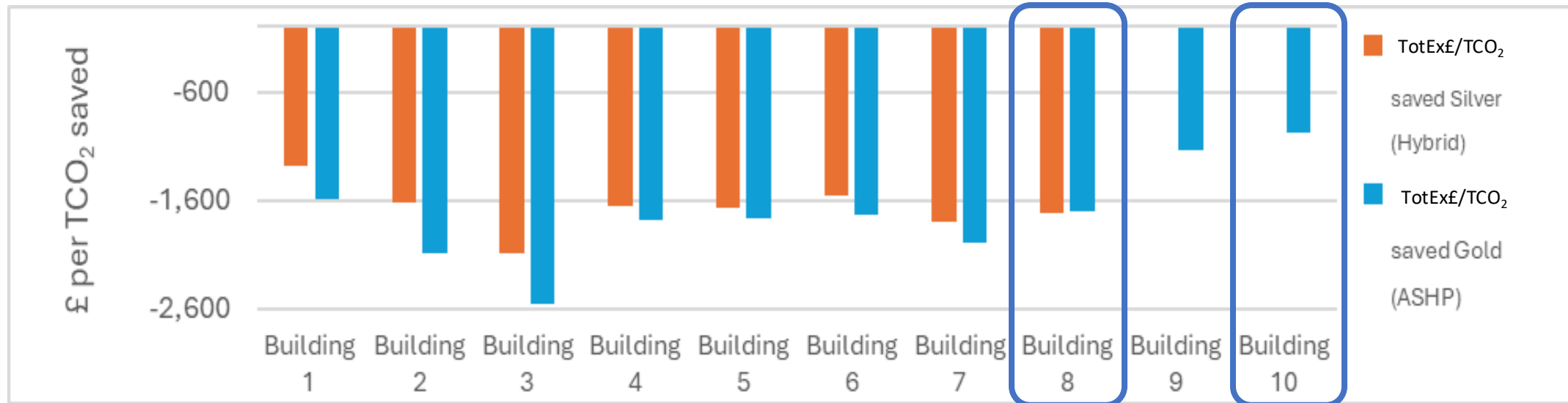
Scenario C

ASHPs only

DEFINING RETROFIT PLAN FOR DECARBONISING HEAT



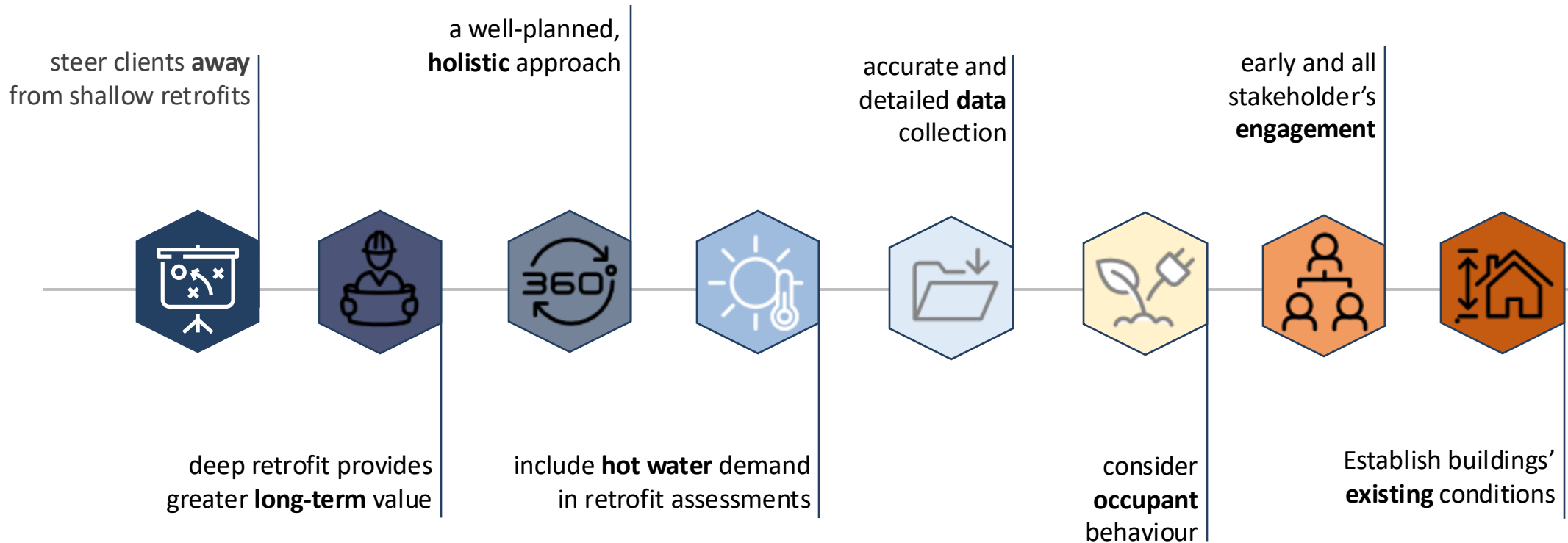
DEFINING RETROFIT PLAN FOR DECARBONISING HEAT



DEFINING RETROFIT PLAN FOR DECARBONISING HEAT

Block of flats	Space htg demand (modelled)	% reduction on energy demand against the baseline	% reduction on initial boiler load
Building 1 (high-rise)	119 kWh/m ² yr	-58%	-43%
Building 2 (medium rise)	153 kWh/m ² yr	-67%	-59%
Building 3 (low-rise)	100 kWh/m ² yr	-50%	-35%
Building 4 (low-rise)	131 kWh/m ² yr	-62%	-52%
Building 5 (low-rise)	126 kWh/m ² yr	-60%	-57%
Building 6 (low-rise)	112 kWh/m ² yr	-55%	-47%
Building 7 (low-rise)	161 kWh/m ² yr	-69%	-51%
Building 8 (temp. homeless unit)	265 kWh/m ² yr	-81%	-53%
Building 9 (terraced)	155 kWh/m ² yr	-68%	-34%
Building 10 (terraced)	220 kWh/m ² yr	-77%	-40%

LESSONS LEARNT



NEXT STEPS ON DEFINING THE RETROFIT WORKS

explore

current and future
building usage

investigate

key areas when
data is limited

analyse

actual hot water usage &
electricity consumption **data**

assess

occupant
comfort levels

monitor

internal air
temperatures

evaluate

the impact of **vacant flats** on
overall energy consumption

CONCLUSION



01

- Adopting **energy** consumption as a **metric**

Deep retrofitting can significantly contribute to the **decarbonisation** journey & enhances **energy security** and **grid stability**.

02



03



- Deep retrofits, offer **long-term benefits** (occupant health and well-being, reduced maintenance costs, and lower energy bills)

Engagement by all stakeholders, especially the **occupants**, is vital and ensures buy-in and proper use of the retrofitted systems

04



- **Future monitoring** of energy use and building performance ensures continued success and allows for necessary adjustments over time.



05



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THANK YOU! Q & A

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EMAIL: evangelia.mitsiakou@aecom.com

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