

Architecture as Gamechanger



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**SUSTAINABLE
ENERGY WEEK**

An initiative
of the



European
Commission

96%

Reduction in energy **££**

81%

GAS USE REDUCTION kWh

67%

ELECTRICITY USE REDUCTION kWh



QUALITY OF LIFE QUALITY OUTCOMES

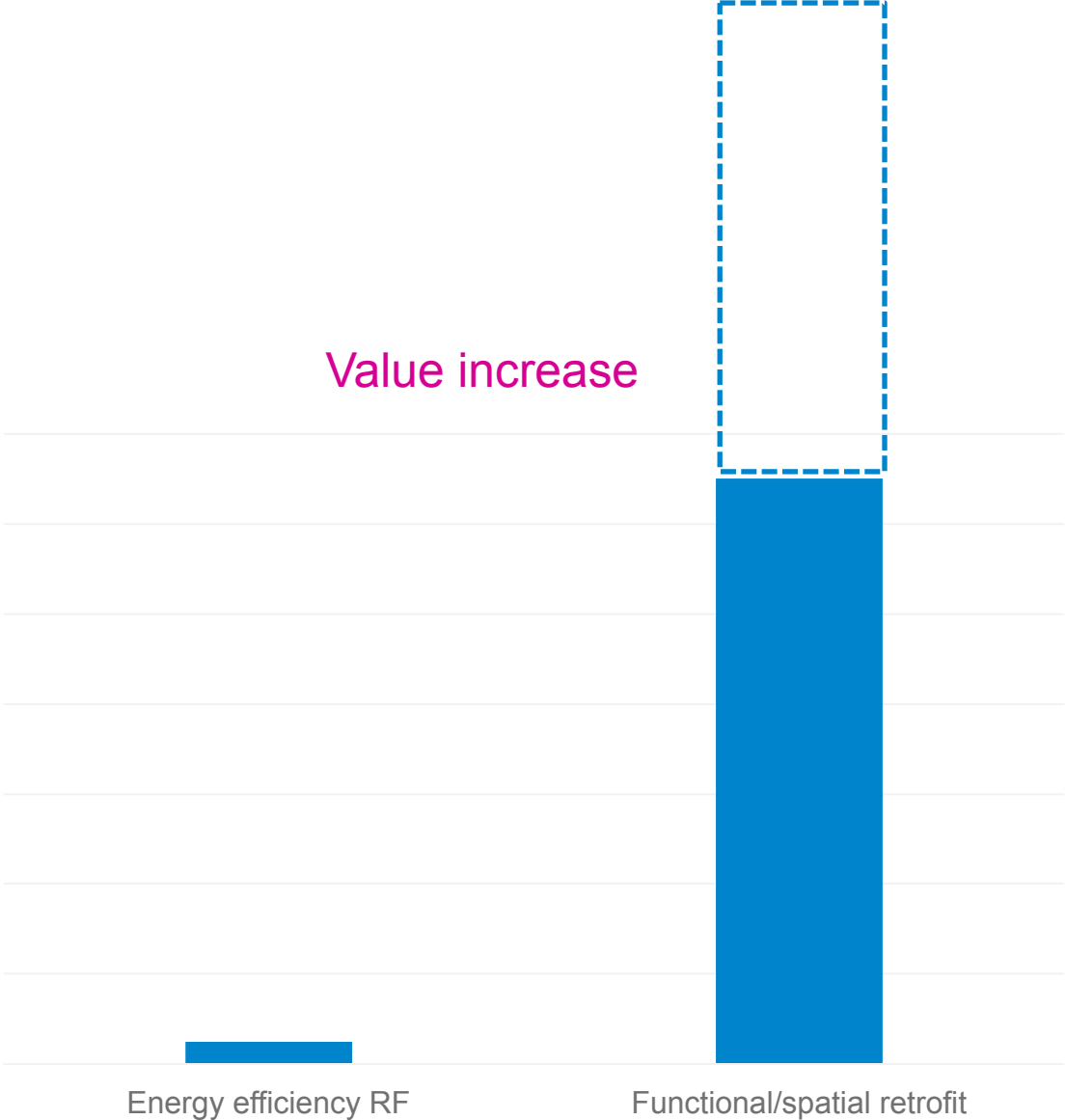
Pupil detentions significantly reduced



THINK BIG

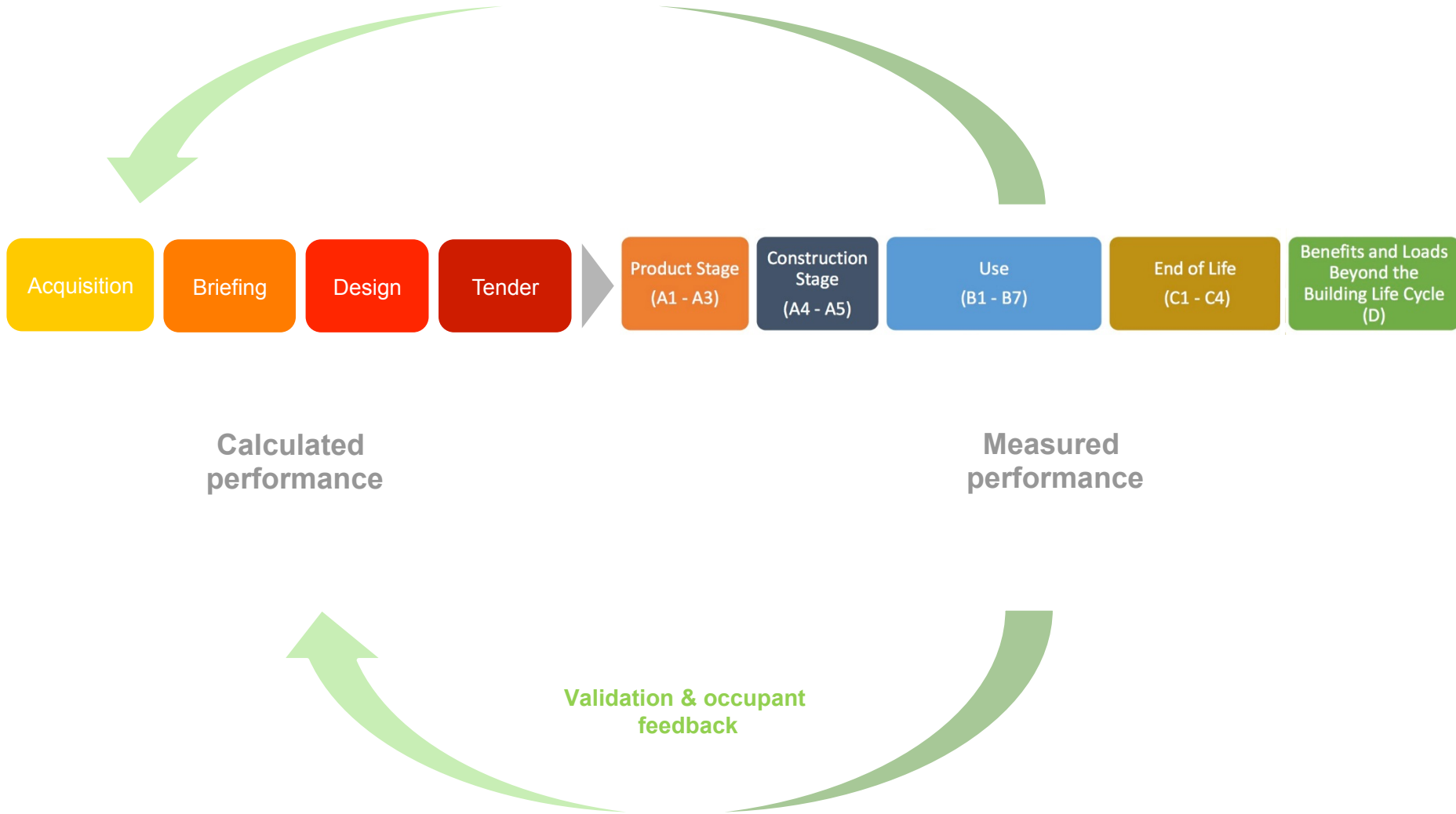


A DESIGN PROBLEM | ARCHITECTURE AS GAME-CHANGER



We need more data!

VALIDATION | THE ROLE OF FEEDBACK IN CONTINUOUS IMPROVEMENT



— EU RESEARCH – THINKING BIG!

- Architectural design as gamechanger
- Validation
- Disclosure
- Lifecycle approach

**CLEAN ENERGY
FOR ALL EUROPEANS**



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MACRO-OBJECTIVES & INDICATORS

1. GHG Emissions

Along the building lifecycle

Primary & Delivered Energy consumption in use: kWh/m²/yr

Global Warming Potential
embodied CO₂ eq./m²

2. Material Impacts

Low impact material life cycles

Bill of Materials:
Abiotic fossil fuels, minerals and metals, Biotic materials

Waste Flows: kg/m²
Disposed, reused, recycled, E recovery

3. Water Use

Circular use of water resources

Use Phase Consumption:
m³/occupant/yr

4. IEQ

Healthy & comfortable spaces

Indoor Air Quality: ventilation rate l/s/m²; CO₂ ppm; RH %
Pollutants: TVOC, CVOC, RI VOC, formaldehyde, benzene, PM_{2.5} & 10
Thermal Comfort: % time out of range degree days or hours

Light
Acoustic
Visual

5. Climate Change

Adaptation, resilience & impact

Extreme weather events under future climate scenarios:
Thermal Comfort: % time out of range degree days or hours 2030/2050
Flood Risk: surface water runoff; flood risk area

Sun Rain
Wind Snow
Sea level

6. Cost & Value

Optimised over whole life

Life cycle costs
EUR/m²/yr

Value Creation & Risk Factors:
Data quality of indicators

Service Life
Adaptability
Deconstruction/Reuse/
recyclability

Other LCA Criteria:
ozone depletion, acidification,
eutrophication, Photochemical
ozone creation