Eceee summer study, June 2024

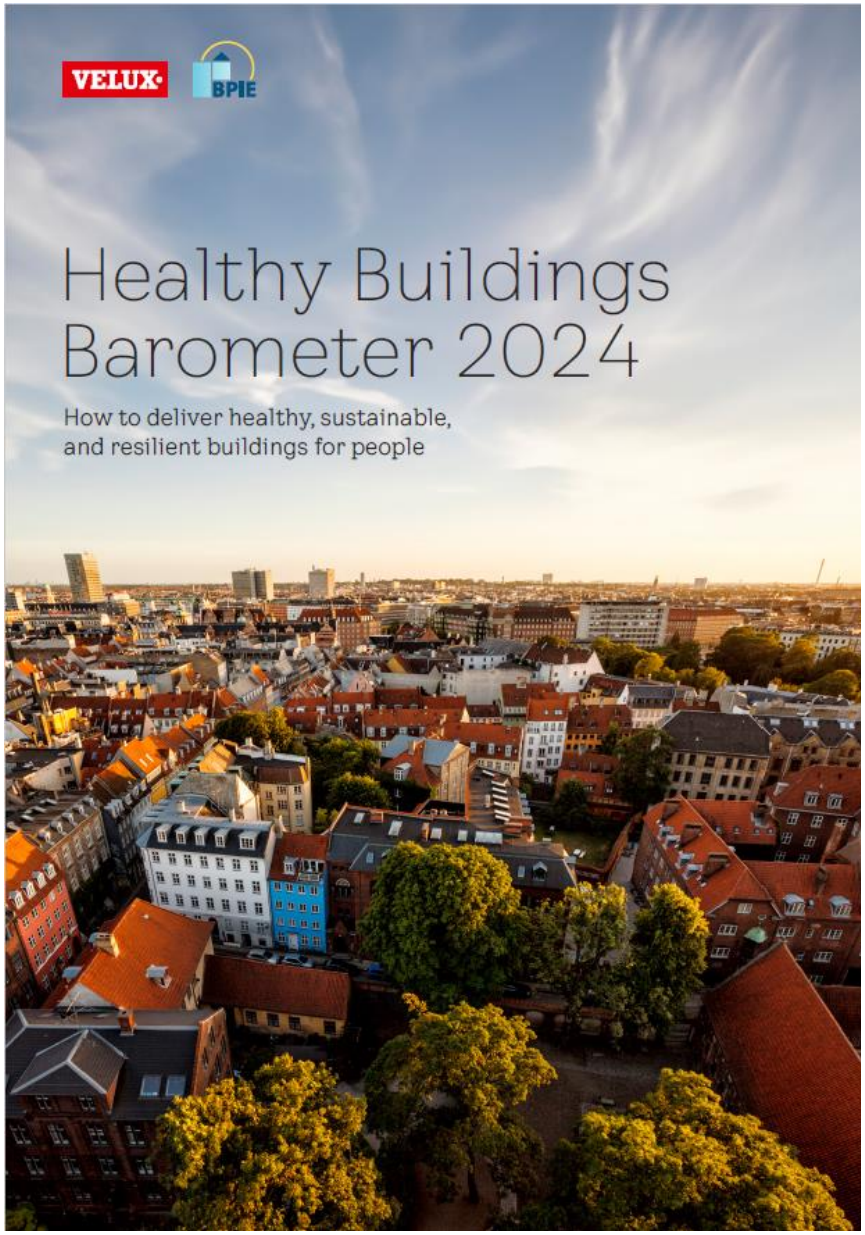
How to embed health and well-being in policies to ensure healthy, sustainable, and resilient buildings



HEALTHY BUILDINGS BAROMETER 2024

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Building Performance Institute Europe (BPIE)

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METHODOLOGICAL STEPS

01 Literature review

- Status-quo
- Research gaps

02 Framework development

- Response to research gaps
- Validation by experts

03 Linking data to indicators

- Existing data EU and MS level
- Track progress since 2015

04 Country-based assessment of framework

- Assess best practices in 7 countries
- Ratio of indicators and dimensions covered

05 Formulate policy recommendations

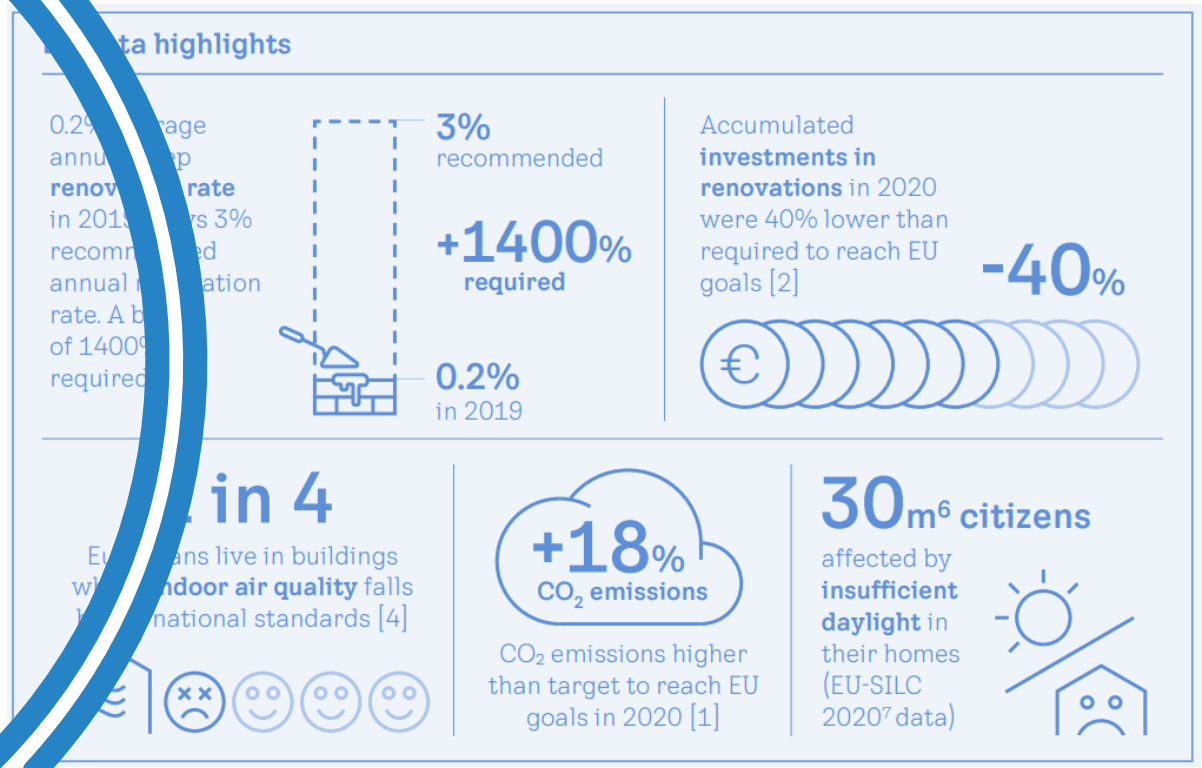
- Match data to policy gaps
- Connect recommendations to stakeholders

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CHALLENGES

- Lack of focus on health and well-being
- Renovation urgency
- Renovation gap
- Resource intensive construction

unhealthy buildings
overcrowding
poor IAQ and daylight
heat waves
inflation



[1] BPIE, 'EU Buildings Climate Tracker 2nd
[2] European Commission. Directorate General fo
energy renovation activities and the uptake of nearly zero
ions Office, 2019.
[3] BPIE, 'How to design fair and effective minimum energy performance
[4] A. Asikainen et al., 'The Proportion of Residences in European Countries with Ventilation Rates below the Regulation Based Limit Value', Int. J. Vent., vol. 12
129–134, Sep. 2013

BENEFIT ALL BUILDING TYPES

FOCUS BEYOND HOMES TO HEALTH IN ALL BUILDINGS



Homes

Renovating homes to make them healthier leads to a range of benefits



Workplaces

A healthier workplace is good for workers and the economy



Schools

Making schools healthier also makes them better places to learn



Hospitals

Renovating hospitals has many positive knock-on effects for patients

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COMPLETE PICTURE

3 DOMAINS

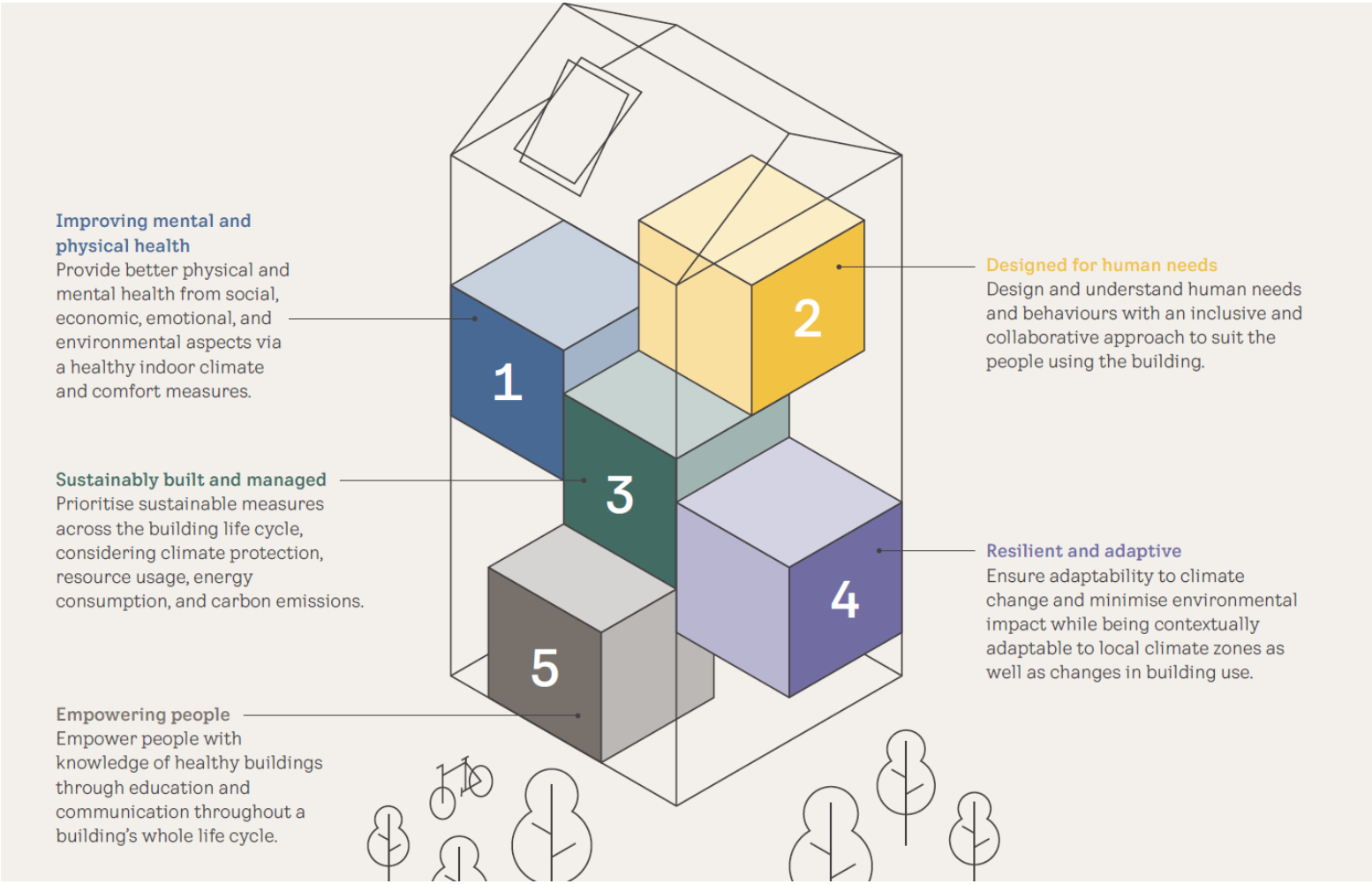


RE-DEFINING HEALTHY BUILDINGS

"Healthy buildings emphasise the health and well-being of their inhabitants, safeguard and enhance sustainability, and enable transformation through empowerment and resilience"



FIVE DIMENSIONS OF HEALTHY BUILDINGS



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1 IMPROVING MENTAL AND PHYSICAL HEALTH

Provide better physical and mental health from social, economic, emotional, and environmental aspects via a healthy indoor climate and comfort measures.

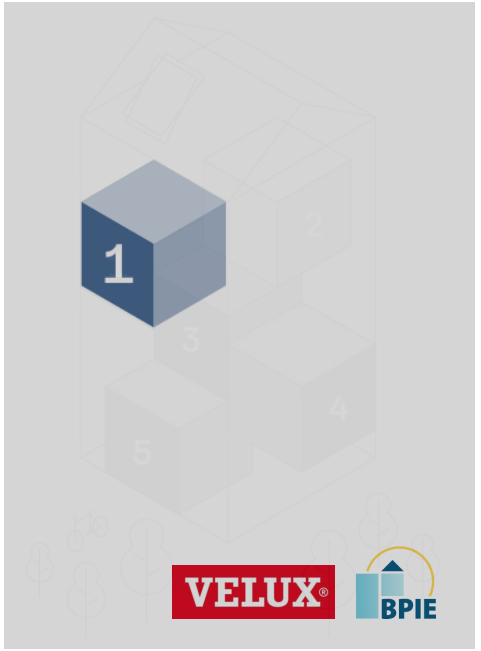
INDOOR ENVIRONMENTAL QUALITY

CONNECTEDNESS TO NATURE

SOCIAL CONNECTIONS

DESIGN APPEAL

AFFORDABILITY



INDICATORS AND SUB-INDICATORS FOR MENTAL AND PHYSICAL HEALTH DIMENSION

Indicators		Sub-indicators	Explanation of sub-indicators
Indoor environmental quality (IEQ)	Indoor air quality (IAQ)	Ultrafine particles, $PM_{2.5}$ and PM_{10}	Exposure according to ALARA principle – as low as reasonably achievable. without detrimental health effects.
		CO_2	Exposure to CO_2 without detrimental health effects.
		CO	Measurement of carbon monoxide to avoid exposure.
		Volatile and semi-volatile organic compounds (VOCs and SVOCs)	Maximum acceptable exposure to toxic VOCs and SVOCs from furniture, building materials and other origins without detrimental health effects.
		Radon	Concentration below the EURATOM IAQ guideline value to prevent from lung cancer.
		Lead	Measurement of lead to avoid exposure.
		Asbestos	Highest safety standards for repairs or removal of asbestos in buildings.
		Ventilation rate	Minimum acceptable ventilation rate to ensure airflow to promote health and well-being.
		Clean air filtration system	Regularly cleaned air filtration systems to prevent infectious diseases from viruses and bacteria.
		Damp / Mould / Condensation	Absence of dampness, mould, and condensation to prevent harmful health effects.
	Thermal comfort	Indoor temperature	The minimum and maximum indoor temperature to ensure health and well-being.
		Subjective feeling of warmth	Satisfaction with the thermal environment.
	Daylight, light and visual comfort	Natural daylight	Sufficient levels of wavelengths of natural daylight. No glare from surrounding buildings. Large view from the windows.
		Electric lighting	Sufficient levels of electric light without glare and without flickering.
	Acoustics comfort	Noise from outdoors	Satisfaction with the acoustic conditions (sound pressure level) of noises coming from outside the building, such as street noise.
		Noise from within the building	Satisfaction with the acoustic conditions (sound pressure level, reverberation) of noises coming from within the building (e.g. apartment, office, from occupants and mechanical systems).

2 DESIGN FOR HUMAN NEEDS

Design and understand human needs and behaviours with an inclusive and collaborative approach to fit the people using the building.

UNIVERSAL DESIGN

HUMAN CENTERED INTERACTION

COMMUNITY DESIGN

INTELLIGENT BUILDING DESIGN



3 SUSTAINABLY BUILT AND MANAGED

Prioritise sustainable measures across the building life cycle, considering climate protection, resource usage, energy consumption, and carbon emissions.

ENERGY AND CARBON EMISSIONS

MATERIAL AND CIRCULARITY

WATER

MANAGEMENT



4 RESILIENT AND ADAPTIVE

Ensure adaptability to climate changes and minimise environmental impact, while being contextually adaptable to local climate zones as well as changes in building use

RESILIENT TO NATURAL HAZARDS

INTEGRATED RESILIENT COOLING AND VENTILATION SYSTEMS

BLUE AND GREEN INFRASTRUCTURE

ADVANCED SMART AND/OR AUTOMATED FEATURES



5 EMPOWERING PEOPLE

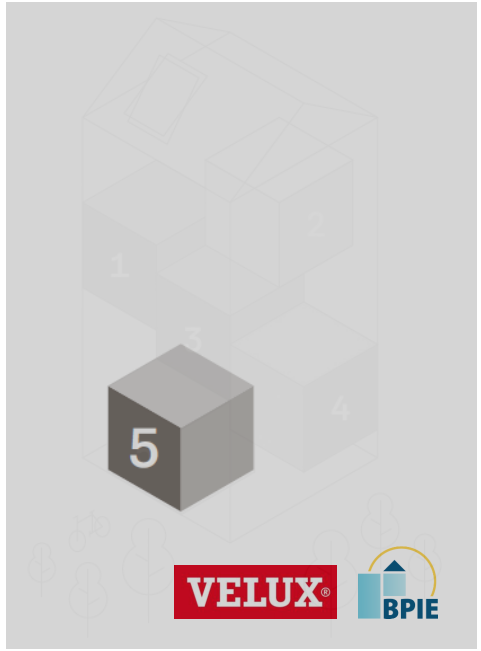
Empower people with knowledge of healthy buildings through education and communication throughout a building's whole life cycle.

SKILLS AND KNOWLEDGE

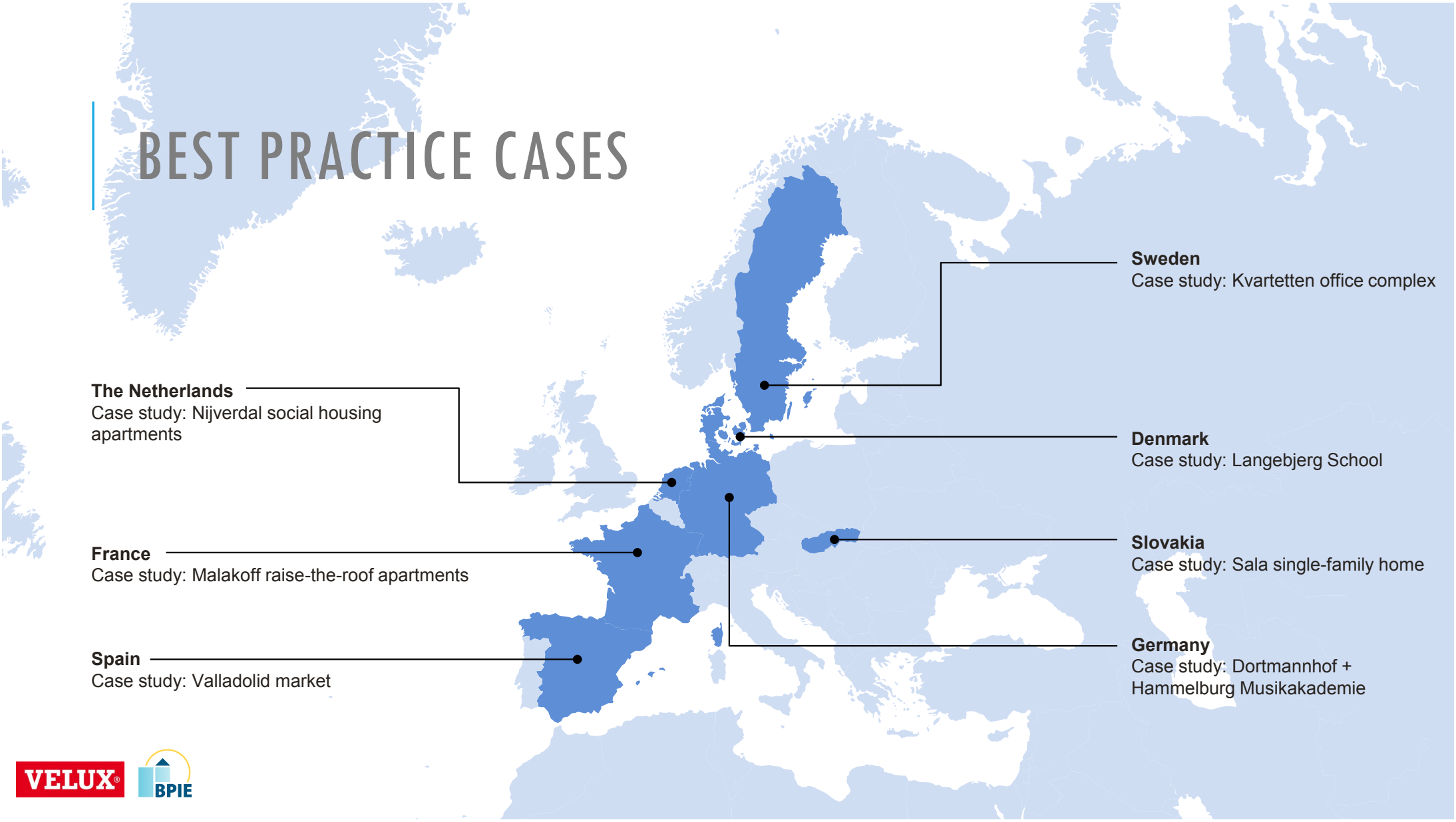
EFFECTIVE COMMUNICATION AMONG STAKEHOLDERS

OCCUPANT BEHAVIOUR AND CONTROL

INFORMATION ACCESS AND SHARING



BEST PRACTICE CASES



Sweden
Case study: Kvartetten office complex

Denmark
Case study: Langebjerg School

Slovakia
Case study: Sala single-family home

Germany
Case study: Dortmannhof + Hammelburg Musikakademie

The Netherlands
Case study: Nijverdal social housing apartments

France
Case study: Malakoff raise-the-roof apartments

Spain
Case study: Valladolid market

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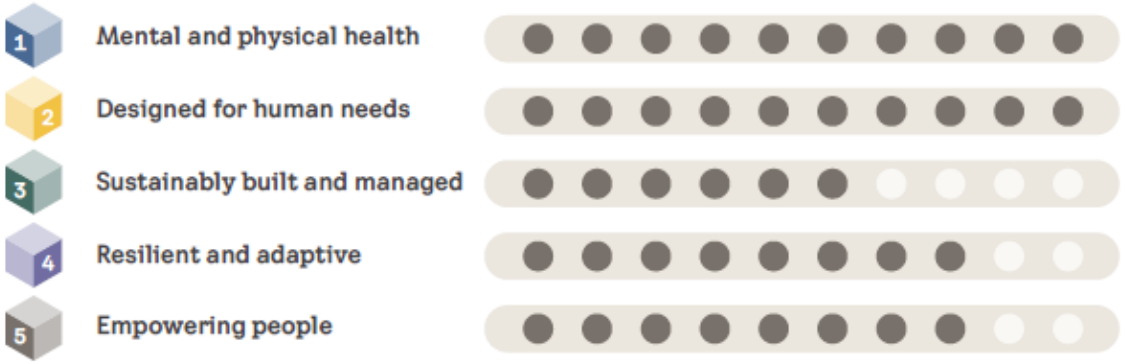
CASE STUDY

France
Malakoff raise-the-roof apartments

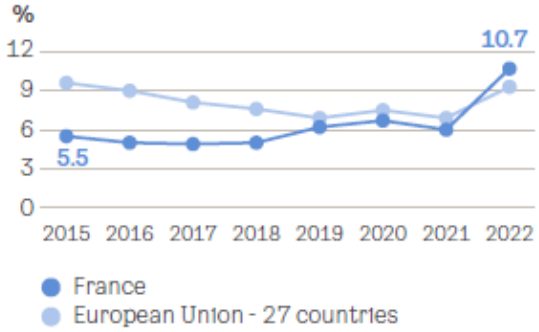


Project details:
https://www.construction21.org/france/case-studies/h/surelevation-a-malakoff.html

Dimensions addressed in case study

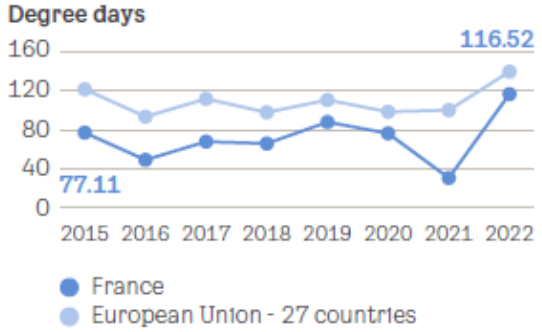


Inability to keep home warm



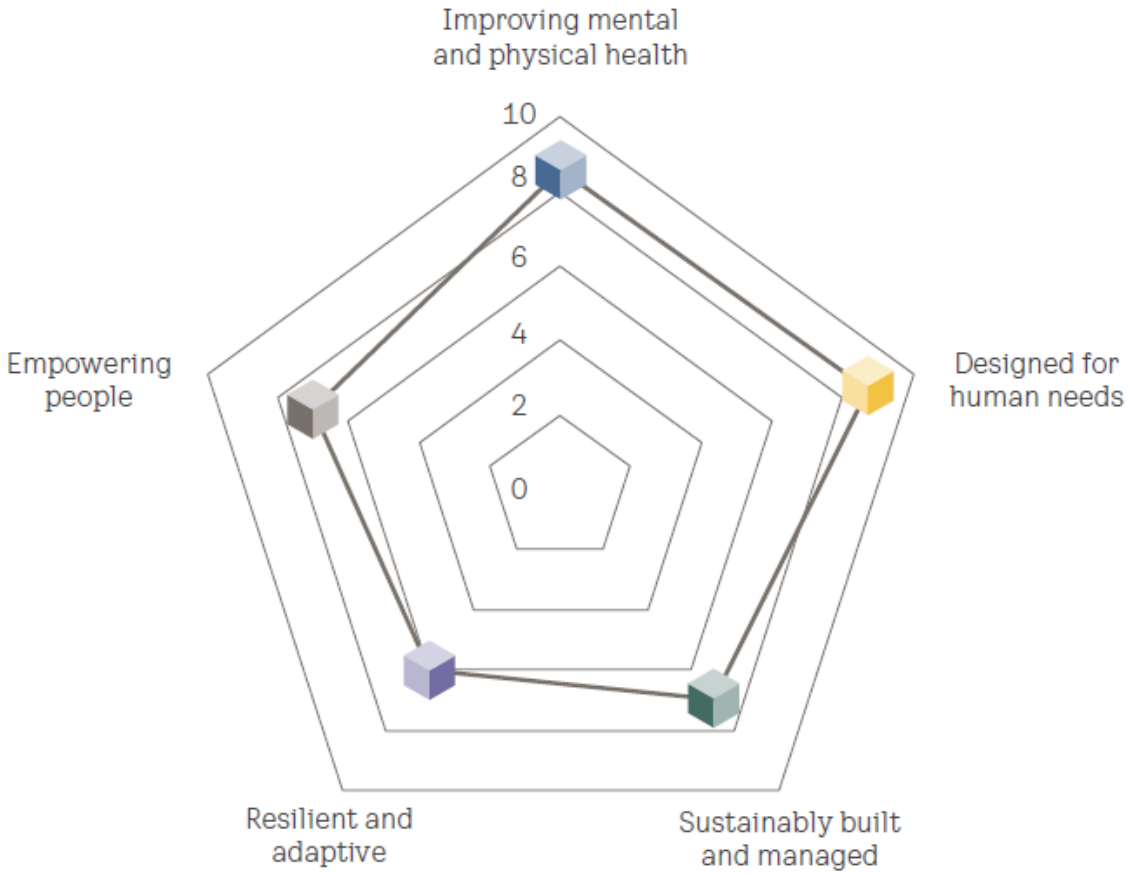
Source: EUROSTAT

Cooling degree days



Source: EUROSTAT

5 DIMENSIONS ACROSS CASES



Areas of action

Broaden the regulatory focus to include the notion of healthy buildings and occupants.

Policy makers must broaden the focus on buildings beyond energy performance and CO_2 emissions to introduce the notion of healthy buildings. Policy influencers including those in the construction sector and civil society must broaden their attention to outcomes beyond energy efficiency and reducing CO_2 emissions to include health along with sustainability parameters as well as resilience and adaptability to a warming climate with more extreme weather.

Ensure access to data so that the buildings' health, sustainability, and resilience can be tracked over time.

Authorities must agree on, and ensure adequate/appropriate and consistent data collection on healthy, sustainable, and resilient building indicators to identify gaps and patterns and track progress accurately.

Increase cross-functional collaboration and information sharing between actors within and outside the construction sector.

Actors within and outside the construction sector must collaborate more closely to ensure a holistic approach to buildings that benefits health, sustainability, and resilience. This includes a better exchange of information and communication on innovative design strategies as key elements to healthy buildings projects.

Use decision-making tools effectively to integrate the health, sustainability, and resilience of buildings.

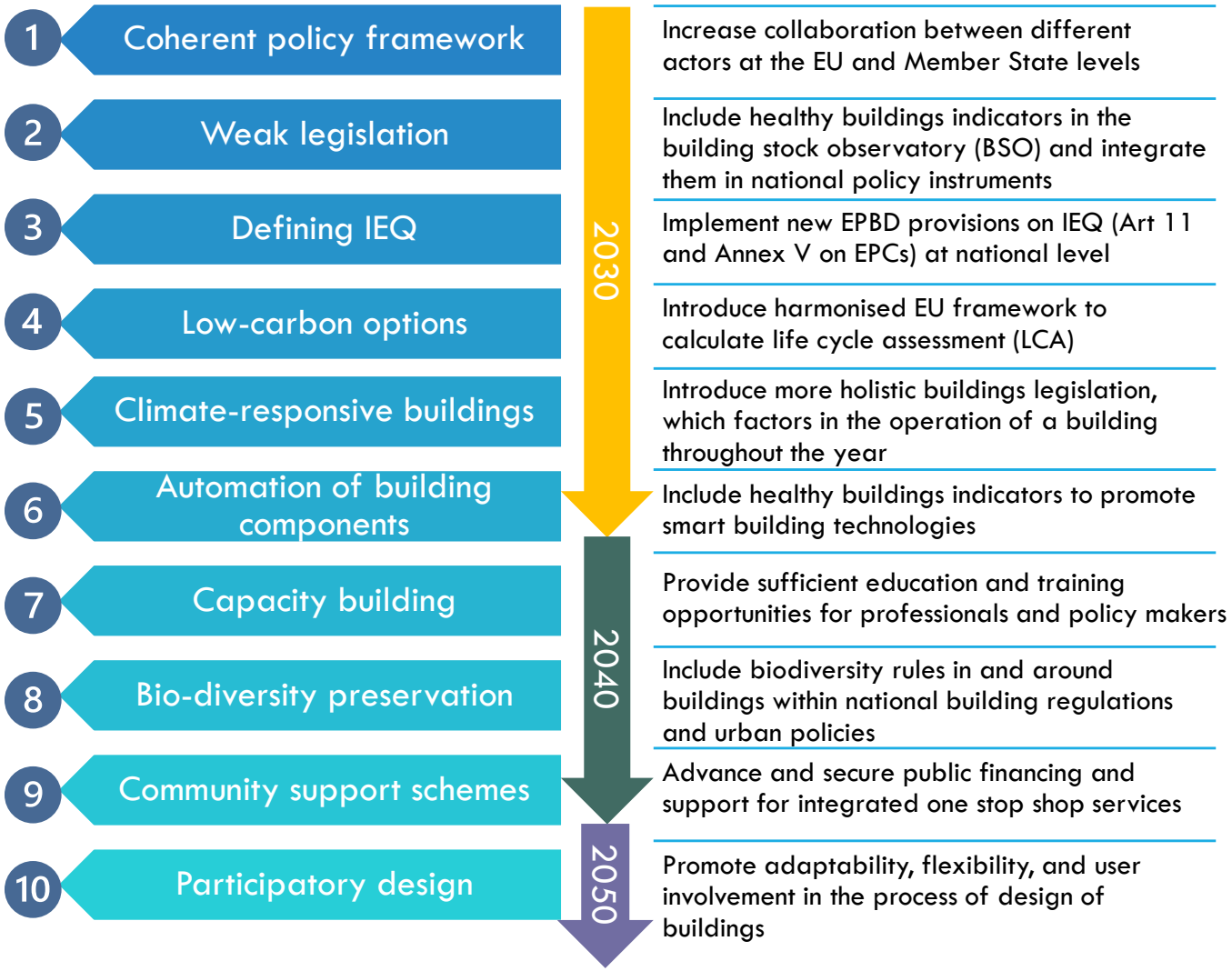
Decision-making tools (such as building-specific tools like building information modelling, building renovation passports, or strategic and procedural tools) should be integrated as appropriate (also digitally) in all phases of a building's life to maximise performance in terms of health, sustainability, and resilience.

Put people at the centre and involve them throughout the lifecycle of buildings.

Design of sustainable buildings must take its starting point in human needs, putting the user at the centre of the design, and involving them in optimising the operation of the building, including smart automisation and guidance during the lifetime of the building.

5 AREAS OF ACTION

GAPS IN POLICIES AND RECOMMENDED ACTIONS



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THANK YOU!

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