

Belimo
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Framework

Future-ready buildings framework (Issue 1)

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Defining future-readiness through
lessons from our building projects

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Introduction

Decarbonizing existing buildings is one of the most effective ways to reduce greenhouse gas emissions and accelerate the transition to a low-carbon future. With around 80% of today's building stock expected to remain in use in 2050, transforming existing buildings represents one of the greatest opportunities for climate action.

Over four years of collaborating with building owners, operators, consulting engineers, and installers, the Belimo Climate Foundation has gained valuable insights into what makes building transformation projects successful. Our experience shows that lasting impact depends on much more than technology upgrades, energy-efficiency measures, and decarbonization. It requires clear objectives, effective governance, sound economics, continuous learning, and the ability to create value beyond carbon reduction.

These experiences revealed two complementary insights. First, successful building transformation projects share several enabling factors that increase the likelihood of creating lasting impact. Second, successful outcomes are characterized by a broader set of building qualities that extend beyond carbon reduction alone.

The five lessons presented below describe how successful building transformation projects can be delivered. The Future-Ready Buildings Framework defines what successful transformation should ultimately achieve.

Five lessons learned from our building decarbonization projects

1. Start with diagnostics and a shared vision

Successful projects begin with a clear understanding of building's current performance. Energy assessments, operational diagnostics, and stakeholder alignment should precede design decisions. Project partners should jointly define a measurable target vision that specifies project scope, key performance indicators, and a realistic greenhouse gas reduction pathway.

Importantly, this vision should extend beyond carbon reduction. Buildings should also establish ambitions related to economic performance, climate resilience, occupant well-being, indoor environmental quality, and long-term adaptability.

By defining these objectives at the outset, stakeholders align around a shared direction and can make decisions that continue delivering quantifiable value under future conditions.

2. Clarify roles and governance early

Building transformation projects involve a wide range of stakeholders, including building owners, operators, consulting engineers, installers, financiers, and occupants. Effective collaboration depends on clearly defined responsibilities and decision-making processes. Establishing

governance structures, responsibilities, and escalation paths early reduces implementation risks, improves project steering, and helps manage complexity throughout the project lifecycle. Strong governance enables stakeholders to align around both short-term project delivery and long-term building value.

3. Make value creation visible

Investment decisions require a robust and transparent business case. Capital expenditures, operating costs, energy savings, and emissions reductions should be assessed using a consistent set of performance indicators.

However, buildings generate value beyond traditional financial and environmental metrics. Improved occupant comfort, healthier indoor environments, reduced operational risks, enhanced resilience, and stronger asset value can be equally important outcomes.

Projects should therefore be evaluated from a lifecycle perspective that captures both measurable financial and environmental performance and broader environmental and societal benefits. Making these value drivers visible enables better investment decisions and stronger stakeholder commitment.

4. Create learning loops

Engineering bridges ambition and real-world impact. High-quality design and implementation are essential, but they must be complemented by performance verification once systems become operational.

Integrated commissioning and continuous feedback loops between planning, implementation, and operation help identify performance gaps, prevent quality losses, and ensure that projected outcomes materialize in practice.

These insights provide the foundation for continuous improvement and help buildings adapt to evolving technologies, user needs, and climate conditions.

5. Design for scale and adaptation

Individual success stories alone will not transform the building sector. Effective solutions must be repeatable, transferable, and economically viable across different building types and ownership models. Standardization, automation, modular approaches, and data-driven tools can significantly reduce project costs, planning effort, and implementation complexity. At the same time, buildings should be designed to remain adaptable. Flexible systems allow buildings to respond to changing regulations, emerging technologies, climate risks, and evolving user requirements without requiring major reinvestment.

Defining future-ready buildings

The five lessons above describe the conditions that help building transformation projects succeed. However, they do not define what success ultimately looks like. Through our project work, we observed that the most successful buildings share a broader set of characteristics that extend beyond carbon reduction alone. These observations led to the development of the Future-Ready Buildings Framework, which defines the qualities that building transformations should seek to achieve. Our project experience shows that successful building transformation depends on more than carbon reductions alone. Long-term performance requires buildings to remain resilient to climate risks, financially attractive, healthy and comfortable for occupants, adaptable to future requirements, and capable of demonstrating their performance over time.

Decarbonization remains the starting point and core focus of our building transformation projects. At the same time, buildings face a growing range of challenges beyond carbon reduction. Rising temperatures, extreme weather events, evolving regulations, changing occupant expectations, and new technologies require buildings to remain resilient, healthy, adaptable, and economically viable throughout their lifecycle.

Based on lessons learned from real-world building projects, the Belimo Climate Foundation defines a future-ready building as:

A low-carbon building that remains resilient, healthy, economically viable, adaptable, and measurable throughout its lifecycle.

The future-ready buildings framework

The framework below illustrates how BCF understands future-readiness. Low-carbon performance forms the base of building transformation, while five additional dimensions ensure that buildings continue to create environmental, economic, and societal value under changing future conditions.

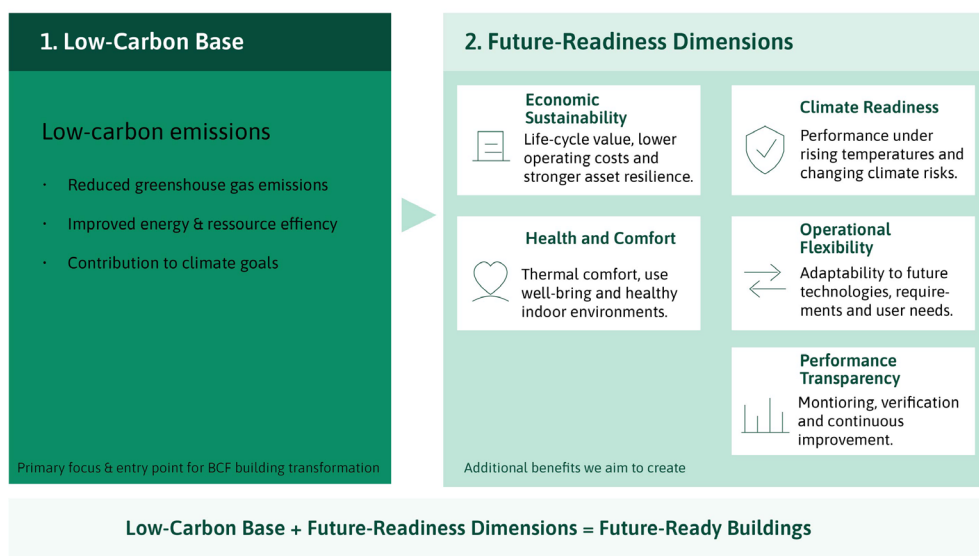


Figure 1. The Belimo Climate Foundation future-ready buildings framework. Low-carbon performance forms the base, complemented by five future-readiness dimensions that support long-term value creation.

Together, these six dimensions provide a practical framework for assessing whether a building is prepared not only to reduce emissions today, but also to remain valuable, resilient, and fit for purpose in the decades ahead.

1. Low-carbon base

Low-carbon emissions

Reducing energy demand and greenhouse gas emissions through sufficiency, efficiency measures, renewable energy integration, optimized building operation, circularity, sustainable materials, and resource-conscious design. Future-ready buildings seek to avoid unnecessary energy and resource consumption first, before meeting remaining demand as efficiently and sustainably as possible. Decarbonization remains the base upon which all other dimensions are built. Without substantial emissions reductions, buildings cannot contribute effectively to climate mitigation goals or meet future regulatory and societal expectations.

2. Future-readiness dimensions

Economic sustainability

Creating long-term value through lower operating costs, reduced risks, future-proof investments, and resilient asset performance. Future-ready buildings remain financially attractive throughout their useful life and continue generating value despite changing market conditions.

Climate readiness

Maintaining performance and functionality under changing climatic conditions, including rising temperatures, extreme weather events, and increasing environmental stresses. Buildings should be designed and operated to remain safe, functional, and comfortable in a changing climate.

Health and comfort

Supporting occupant well-being, safety, productivity, thermal comfort, and healthy indoor air quality. Future-ready buildings place people at the centre by creating indoor environments that enhance health, comfort, and performance.

Operational flexibility

Enabling buildings to respond to future technologies, regulations, business requirements, and changing user needs. Flexible systems and design strategies help ensure that buildings remain relevant and effective without requiring major reinvestment.

Performance transparency

Using monitoring, digital connectivity, automation, verification, and continuous improvement processes to ensure intended outcomes become measurable results. Future-ready buildings continuously demonstrate their performance through data, allowing owners and operators to optimize operation, verify outcomes, effective reporting, and regulatory readiness.

Creating long-term value & future challenges

The six dimensions are closely interconnected. Buildings that perform well across all dimensions are better positioned to create lasting environmental, economic, and societal value. The next generation of building transformation will not be judged solely by the carbon emissions it avoids. Success will increasingly be measured by whether buildings remain valuable, resilient, healthy, adaptable, and high-performing under changing environmental, societal, and economic conditions. Future-ready buildings provide a practical framework for achieving this broader ambition and guiding the transformation of existing buildings toward long-term climate, economic, and societal value.

However, technology alone will not deliver the scale of transformation required. Even the most advanced building solutions can only deliver impact if the necessary skills are available to design, install, operate, and maintain them. As the building sector faces growing workforce shortages and an increasing demand for building retrofits, investing in skills development, continuous learning, and knowledge transfer becomes a critical enabler of the transition. Future-ready buildings therefore depend not only on technology and finance, but also on the people, expertise and competencies required to implement change at scale.

Conclusion

At the Belimo Climate Foundation, we believe that the transition to low-carbon buildings and the creation of future-ready buildings are not separate objectives, but two inseparable parts of the same transformation. While decarbonization of the existing building stock remains the primary goal of every project, climate adaptation and other future-readiness considerations should be incorporated from the outset to ensure long-term resilience and value.

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