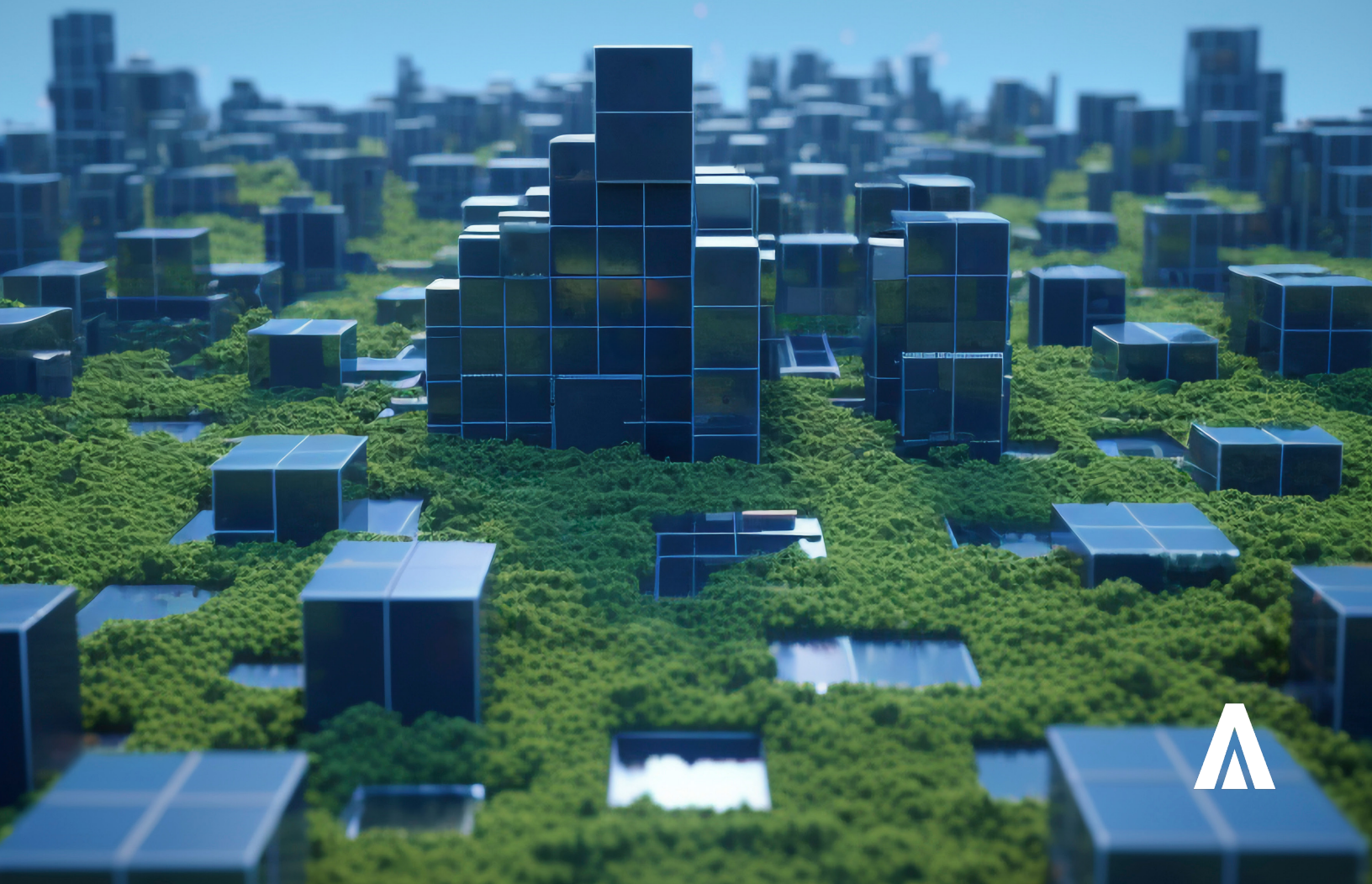
Improving the Large Built Environment

Considerations in Energy Efficiency and Resiliency



Executive Summary

As global energy demands increase and the effects of climate change intensify, the need to improve the efficiency and resilience of the built environment has become urgent. This white paper examines critical considerations for large-scale infrastructure — particularly public sector and mission-critical facilities — and presents strategic approaches for achieving sustainable, secure, and adaptive buildings.

Drawing on insights from public and private sector stakeholders, the paper highlights practical frameworks and technologies to guide organizations forward.

Introduction

Large built environments — including campuses, military installations, hospitals, and urban infrastructure — represent significant energy consumers and critical assets. As climate-related disruptions and operational demands grow, these spaces must evolve to become both energy-efficient and resilient to future stressors.

This paper explores actionable considerations and integrated strategies that organizations and agencies can adopt to ensure long-term performance, sustainability, and risk mitigation in their infrastructure investments.

The Case for Energy Efficiency and Resiliency

A Converging Set of Pressures

Organizations responsible for large infrastructure assets face simultaneous challenges:

- Rising energy costs and emissions targets
- Infrastructure aging and deferred maintenance
- Increasing frequency of extreme weather events
- Mandates to reduce environmental impact and meet regulatory standards

Together, these pressures underscore the importance of a forward-thinking approach to both energy efficiency and resiliency planning.

Key Focus Areas

1. Optimizing Energy Efficiency Across the Built Environment

– Envelope Improvements: High-performance insulation, windows, and building sealing techniques dramatically reduce heating and cooling loads.

– Advanced Control Systems: Intelligent HVAC and lighting systems enable real-time, data-driven energy management.

– Targeted Retrofits: Modernizing legacy buildings with efficient technologies provides outsized returns, especially in mission-critical and high-utilization structures.

2. Building Resilient Infrastructure

– Distributed Energy Resources (DERs): On-site solar, wind, and battery storage improve energy independence and grid reliability.

– Microgrids: Localized energy networks reduce vulnerability to grid outages and support critical operations.

– Climate-Adaptive Design: Infrastructure must be engineered to withstand environmental stressors — from heatwaves and hurricanes to flooding and wildfires.

3. Policy, Planning, and Organizational Alignment

– Updated Codes and Standards: Aligning building codes with the latest energy and resilience standards can drive systemic improvement.

– Incentive Structures: Federal, state, and utility programs can significantly accelerate adoption of advanced energy solutions.

– Performance Metrics: Benchmarking tools allow organizations to track progress, identify underperforming assets, and replicate success.

Lessons from the Field

While each organization's context is unique, several common themes emerged from stakeholder discussions:

- Energy efficiency is foundational — but only when paired with systems thinking and operational buy-in does it yield lasting results.
- Resiliency must be locally informed, accounting for geographic risks, community needs, and infrastructure interdependencies.
- Collaboration is critical — between engineers, planners, facility operators, and leadership, as well as across agencies and sectors.

Recommendations

To improve the energy performance and resiliency of large built environments, organizations should:

1. Conduct holistic infrastructure assessments to identify interrelated efficiency and resiliency opportunities.

2. Integrate DERs and microgrids into long-term planning and budgeting cycles.

3. Adopt a lifecycle cost analysis framework when evaluating capital improvements.

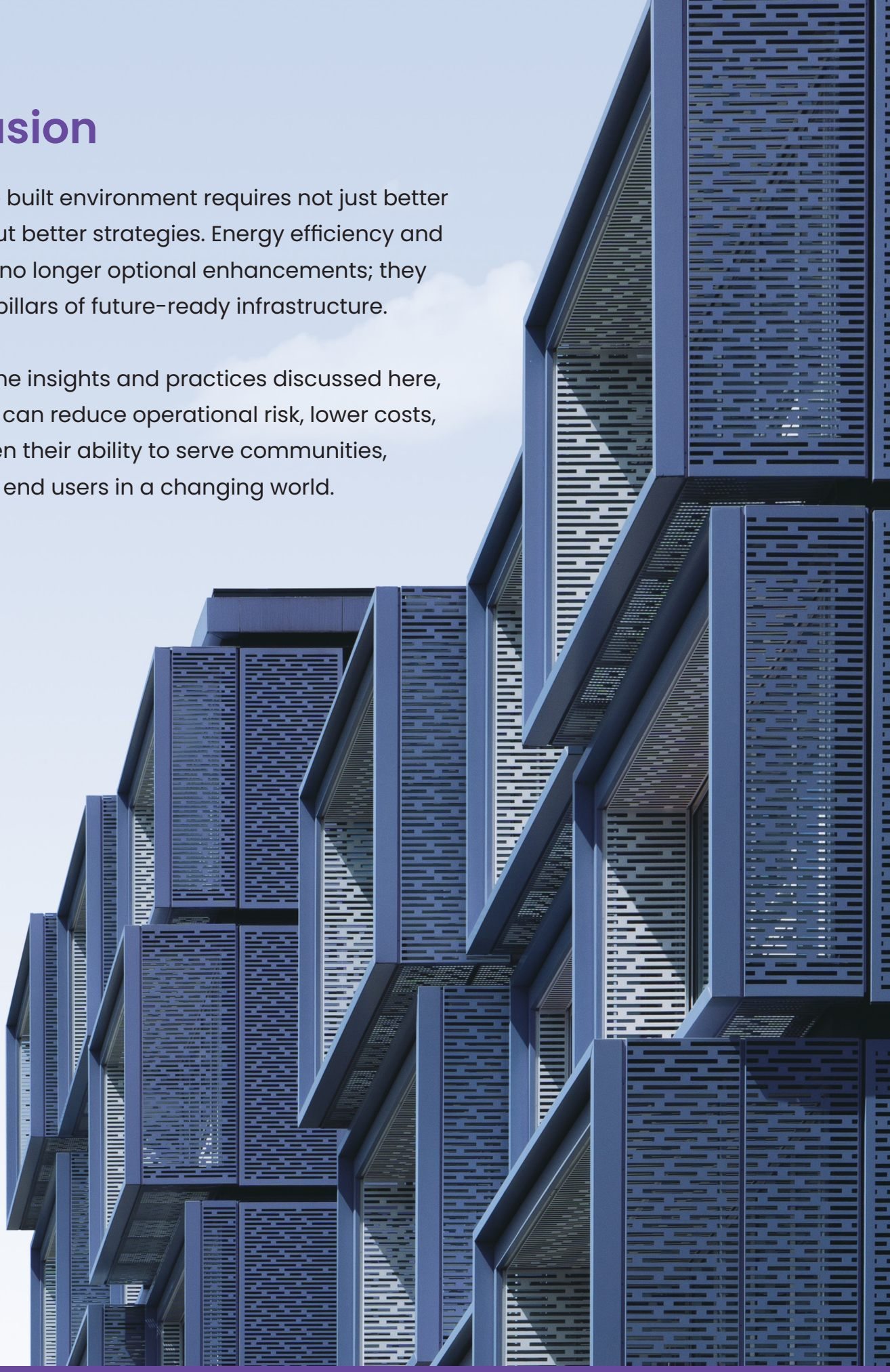
4. Leverage available incentives and public-private partnerships to fund innovation.

5. Prioritize workforce training and knowledge sharing to ensure continuity and institutional learning.

Conclusion

Improving the built environment requires not just better buildings — but better strategies. Energy efficiency and resiliency are no longer optional enhancements; they are essential pillars of future-ready infrastructure.

By adopting the insights and practices discussed here, organizations can reduce operational risk, lower costs, and strengthen their ability to serve communities, missions, and end users in a changing world.



Ascentis
Strategies Institute

About Ascentis Strategies Institute (ASI)

For more than 15 years, the brands under Roosevelt Strategic Council—including Defense Strategies Institute and Ascentis Strategies Institute—have produced executive-level events, summits, and symposia that deliver actionable business intelligence to leaders across government, industry, and academia. Our platforms are designed to empower decision-makers to seize emerging opportunities and drive meaningful progress within their sectors.

Across North America, our events have drawn over 60,000 senior executives and public-sector leaders. Through hundreds of conferences and forums, we've provided critical education, strategic insight, and meaningful connections that help shape the future of core industries.