

Innovation Building Group Best Practices for Modern Methods of Construction



1. Why Operating Costs Are Part of Housing Affordability

Housing affordability discussions in Canada continue to focus primarily on capital costs, land values, financing, and sale prices. While these factors remain critically important, long-term operational costs are increasingly becoming a major component of overall housing attainability.

Operational affordability includes:

- space heating and cooling energy demand,
- domestic hot water consumption,
- maintenance requirements,

- equipment replacement cycles,
- indoor environmental quality,
- resilience during extreme weather events, and
- long-term utility cost exposure.

In practice, these operating factors can materially affect household financial stability over the life of a building.

Through multiple high-performance residential projects in British Columbia, including Orion in Pemberton, we observed that significant reductions in operational costs are achievable when enclosure performance, mechanical systems, and building integration are approached as a coordinated system rather than as isolated design components.

At Orion, monitored annual heating costs were typically in the range of approximately \$30 to \$50 per unit, with annual cooling costs often between \$20 to \$30 per unit under Climate Zone 6 operating conditions. While utility costs vary depending on occupant behaviour and energy pricing, the results demonstrated that substantial reductions in household operating costs are achievable through disciplined envelope and systems integration. These outcomes have several implications.

First, operational affordability becomes increasingly important as energy price volatility increases and climate resilience requirements become more demanding. Buildings with low thermal demand are inherently less exposed to future energy cost escalation. Second, reduced energy demand improves resilience during extreme climate events. Buildings with high-performance envelopes and stable indoor temperatures are generally better able to maintain occupant comfort during heat waves, wildfire smoke events, and short-duration utility disruptions.

Third, lower operational costs reduce long-term financial pressure on households. In many cases, monthly operating savings become comparable in importance to mortgage or rental affordability.

Historically, the industry has often treated building performance and affordability as competing objectives. Our experience increasingly suggests the opposite. When projects are designed using integrated delivery methods, improved enclosure performance can reduce both operational costs and capital costs simultaneously.

Higher-performing envelopes reduce thermal demand. Lower thermal demand reduces HVAC sizing requirements. Smaller mechanical systems reduce coordination complexity, installation costs, maintenance exposure, and long-term replacement costs. As a result, high-performance housing should not be viewed solely as an environmental or sustainability initiative. Properly integrated, it becomes a long-term affordability strategy. The future of attainable housing will depend not only on reducing construction costs, but also on delivering buildings with substantially lower lifetime operating costs, improved durability, and greater climate resilience.

