

The Early Adopters of High-Performance: A Trends Analysis

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NET-ZERO ENERGY-READY CHALLENGE

Supporting, promoting and celebrating
the design and construction of net-zero
energy-ready (NZER) buildings

cleanBC
BETTER BUILDINGS

WINNING PROJECTS



PEATT COMMONS
WEST



UBCO
SKEENA RESIDENCE



CARRINGTON VIEW –
BUILDING A



825 PACIFIC STREET



SFU PARCEL 21



OSO



2150 KEITH DRIVE



UVIC STUDENT
HOUSING



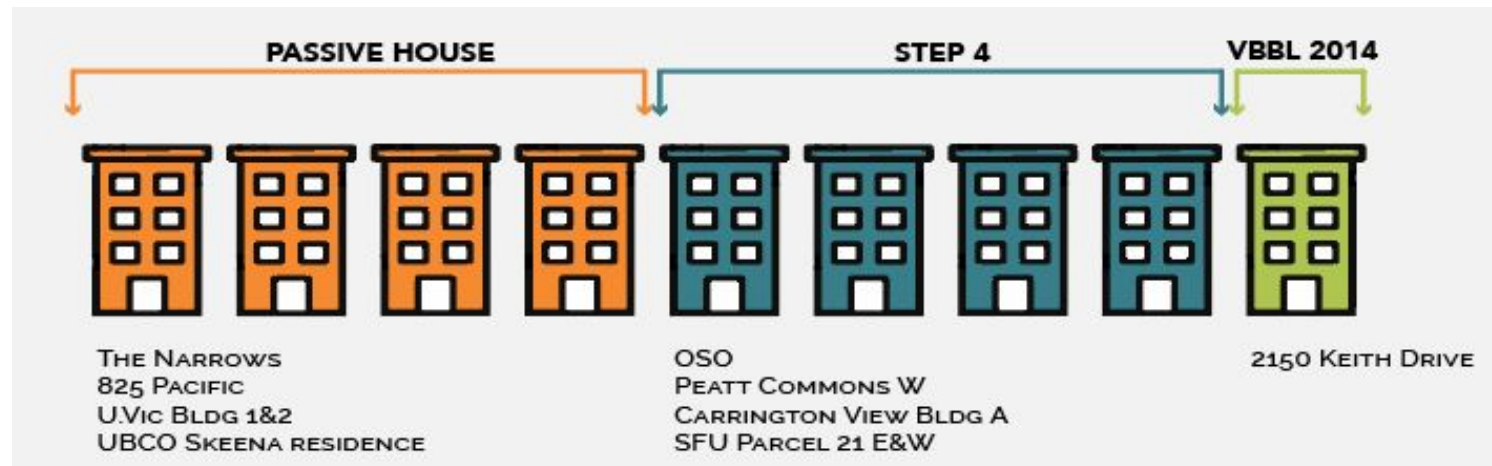
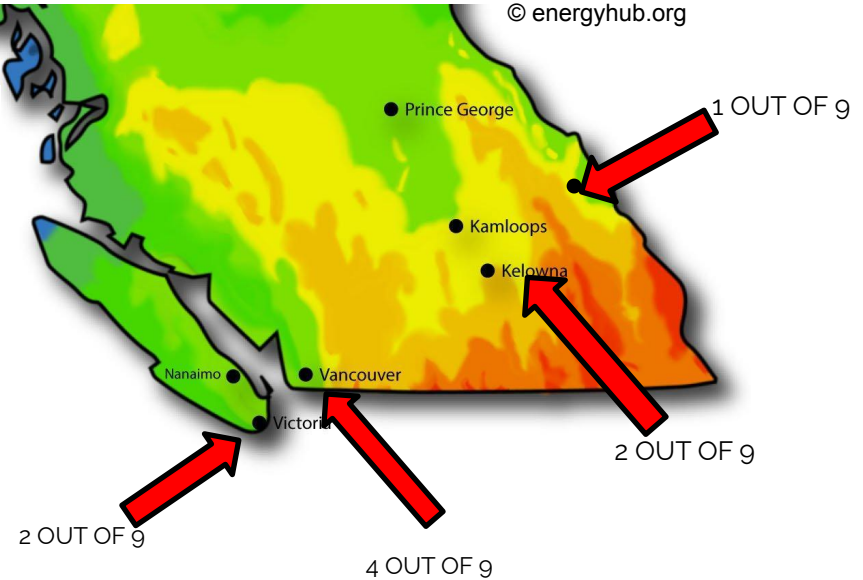
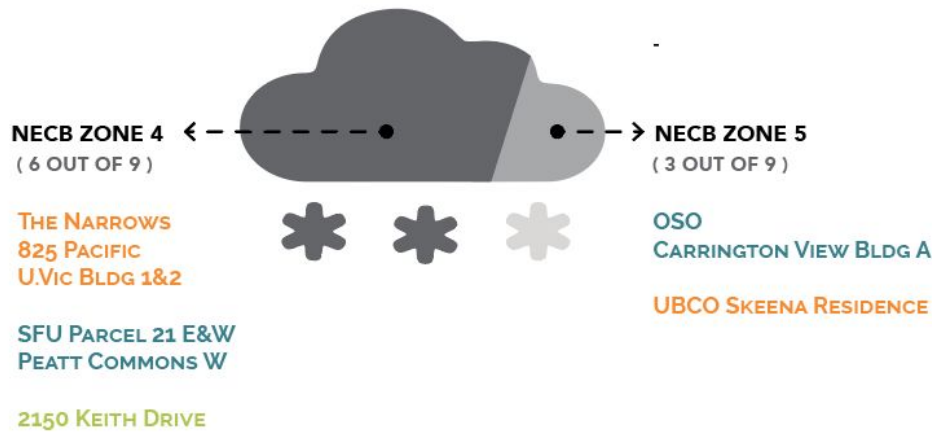
THE NARROWS

**+2
more projects**

For the case studies:
www.zebx.org/resources

CLEANBC NZER CHALLENGE





CLEANBC NZER CHALLENGE



GHG INTENSITY

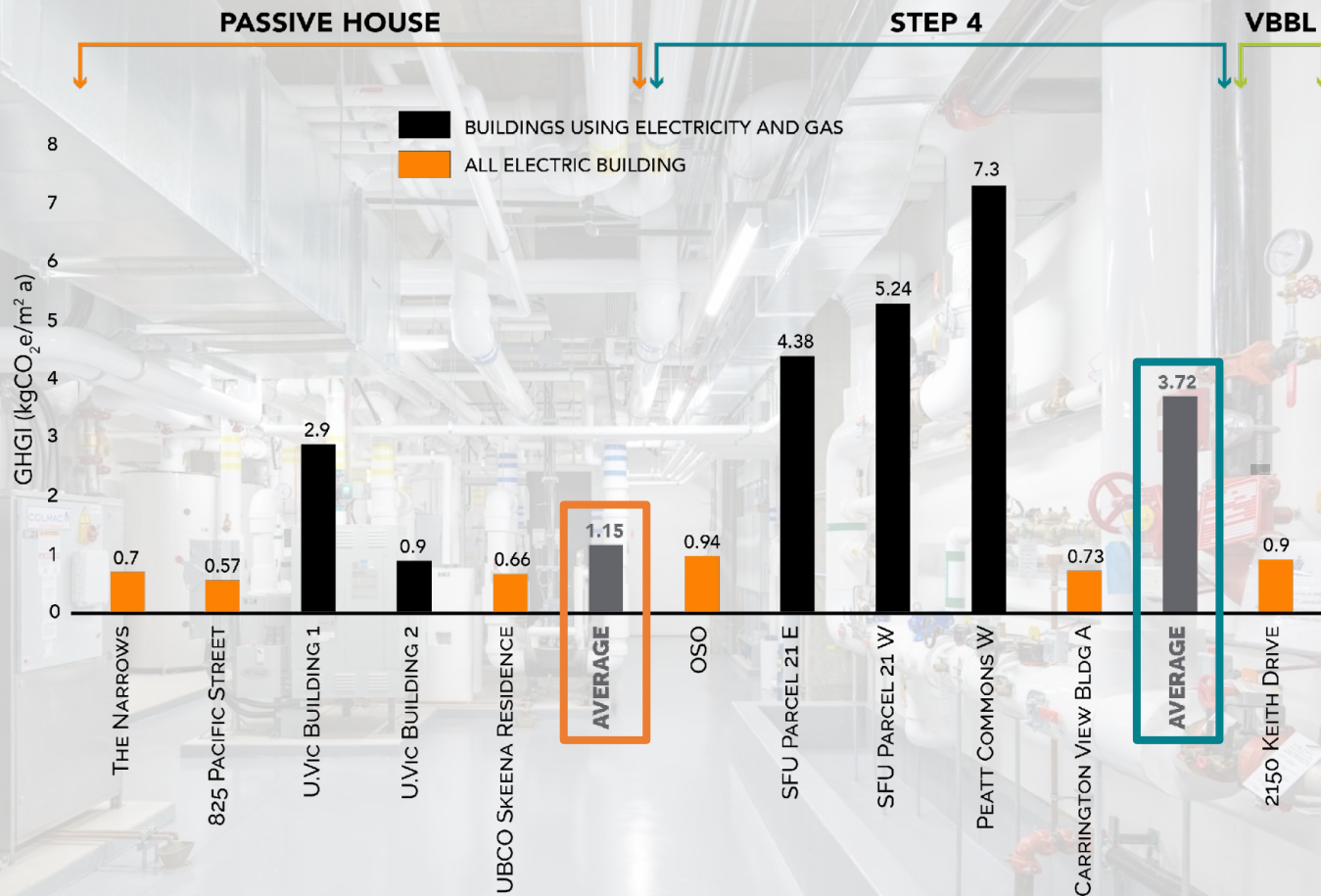
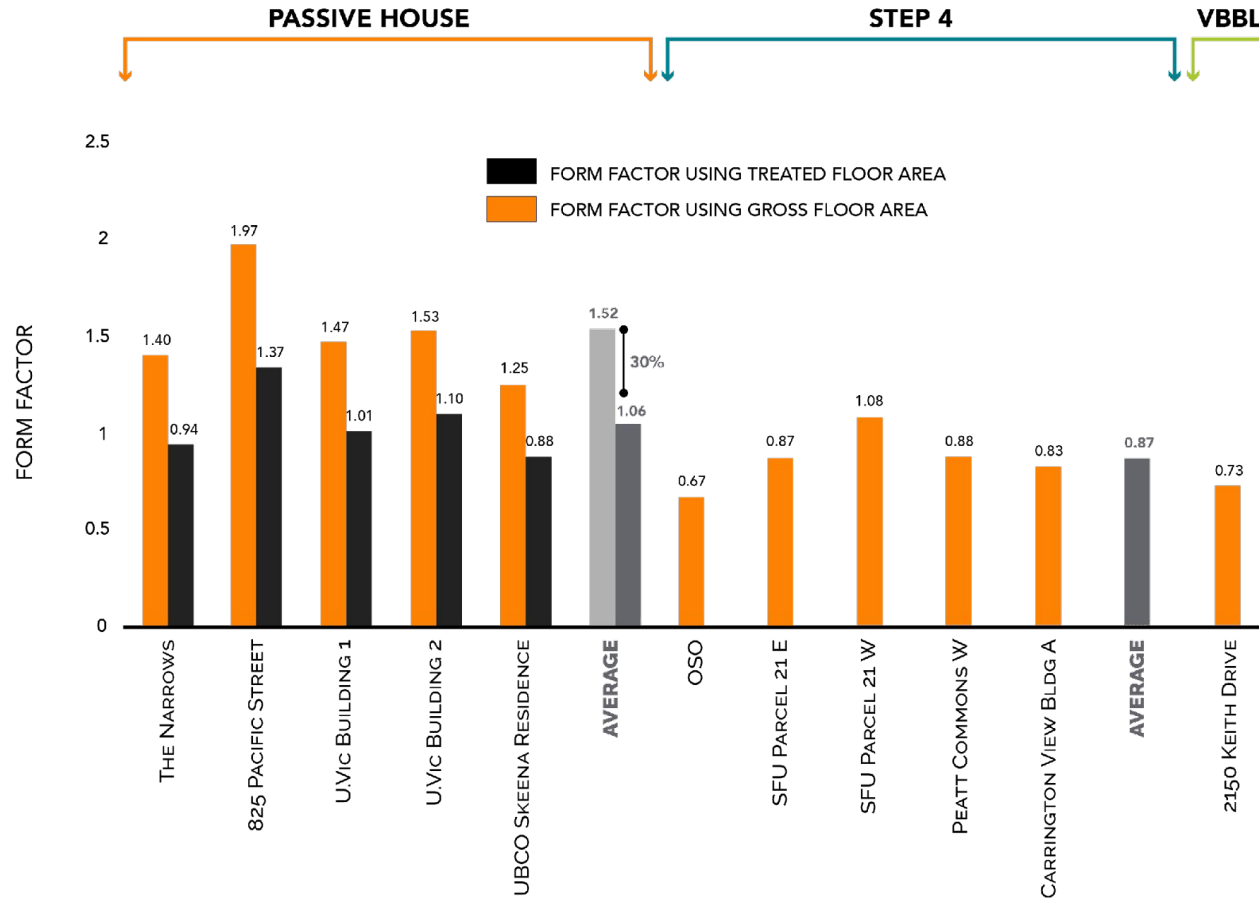


Photo © Andrew Latreille

CLEANBC NZER CHALLENGE



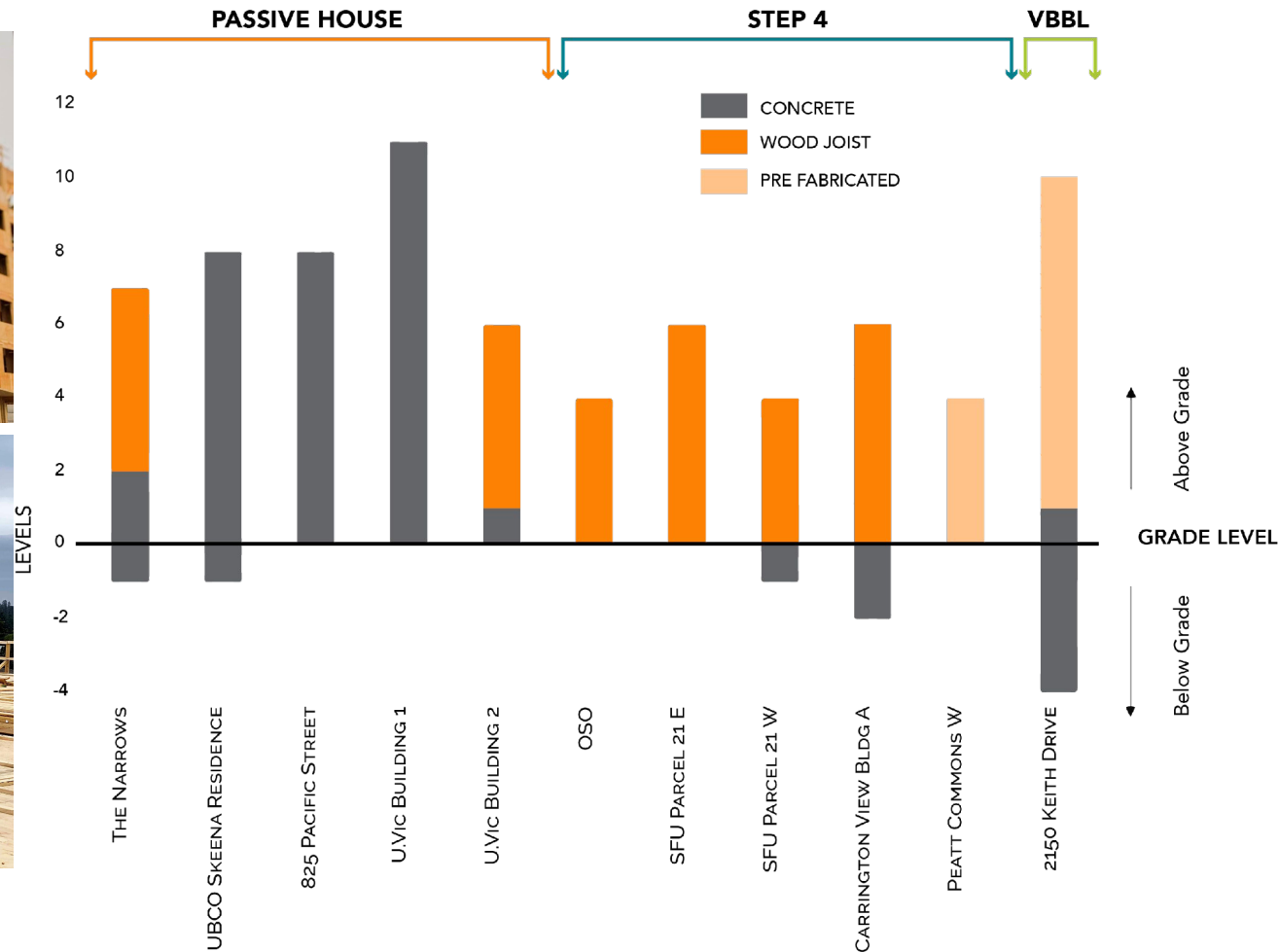
FORM FACTOR



FLOOR AND ROOF MATERIAL



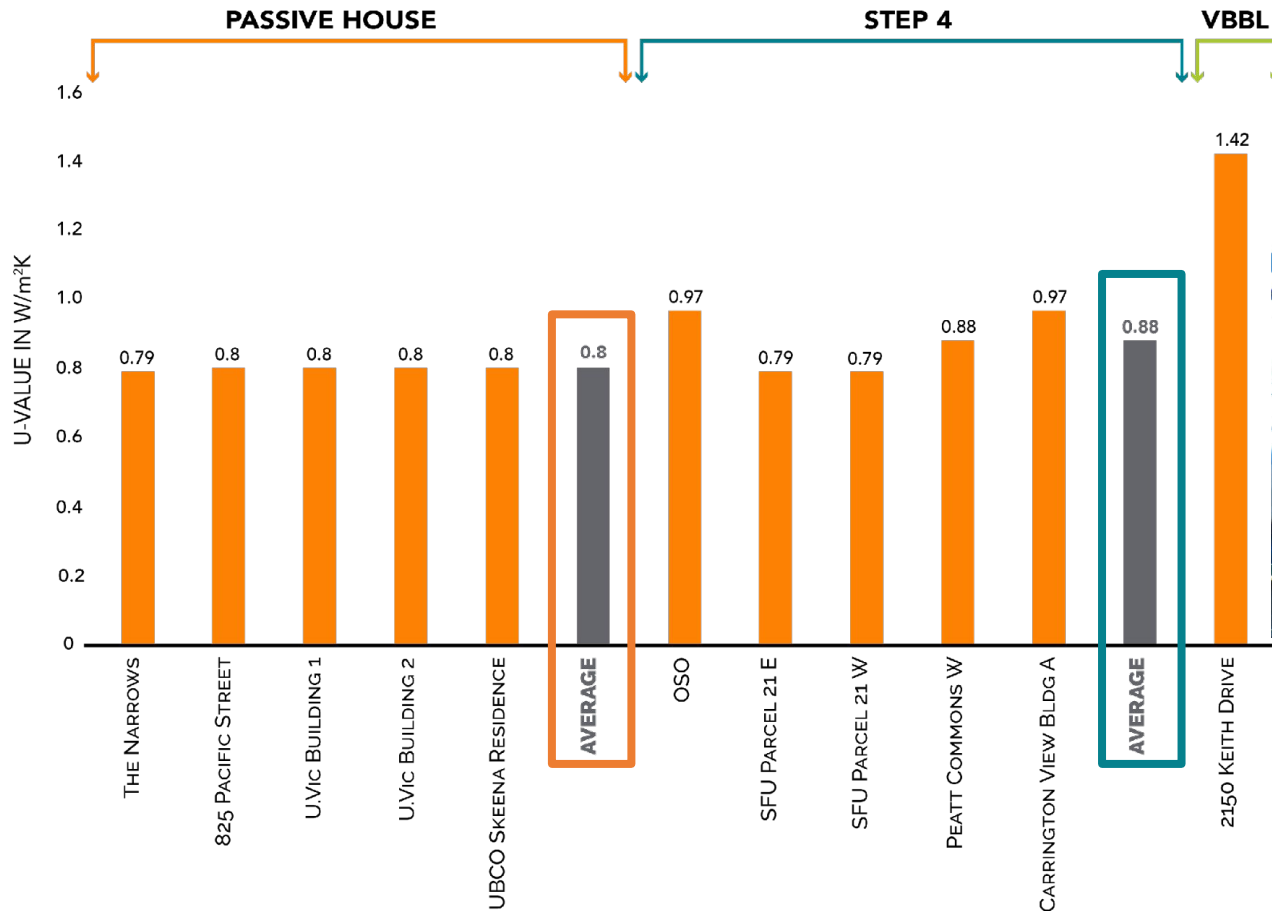
Peatt Commons West, Langford B.C.



CLEANBC NZER CHALLENGE



WINDOW ASSEMBLY



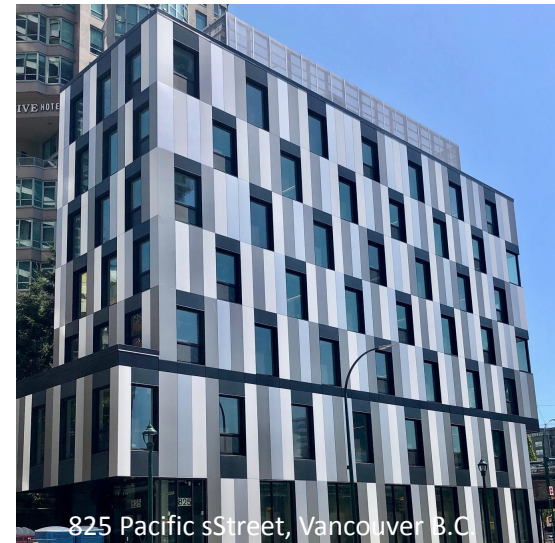
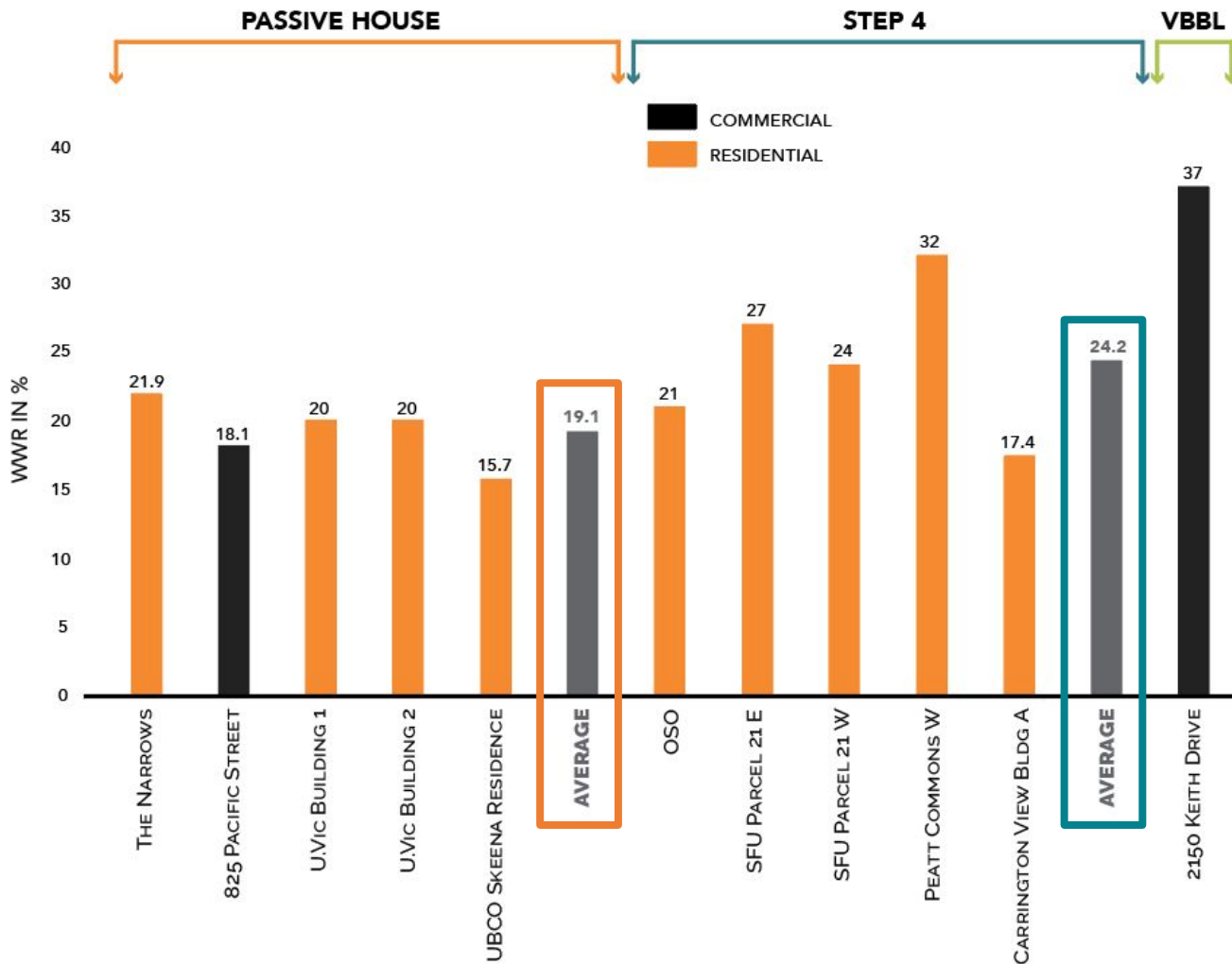
OSO, Golden B.C.

Note: Thermal bridging effects between the window and the surrounding wall is not included.

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WINDOW TO WALL RATIO



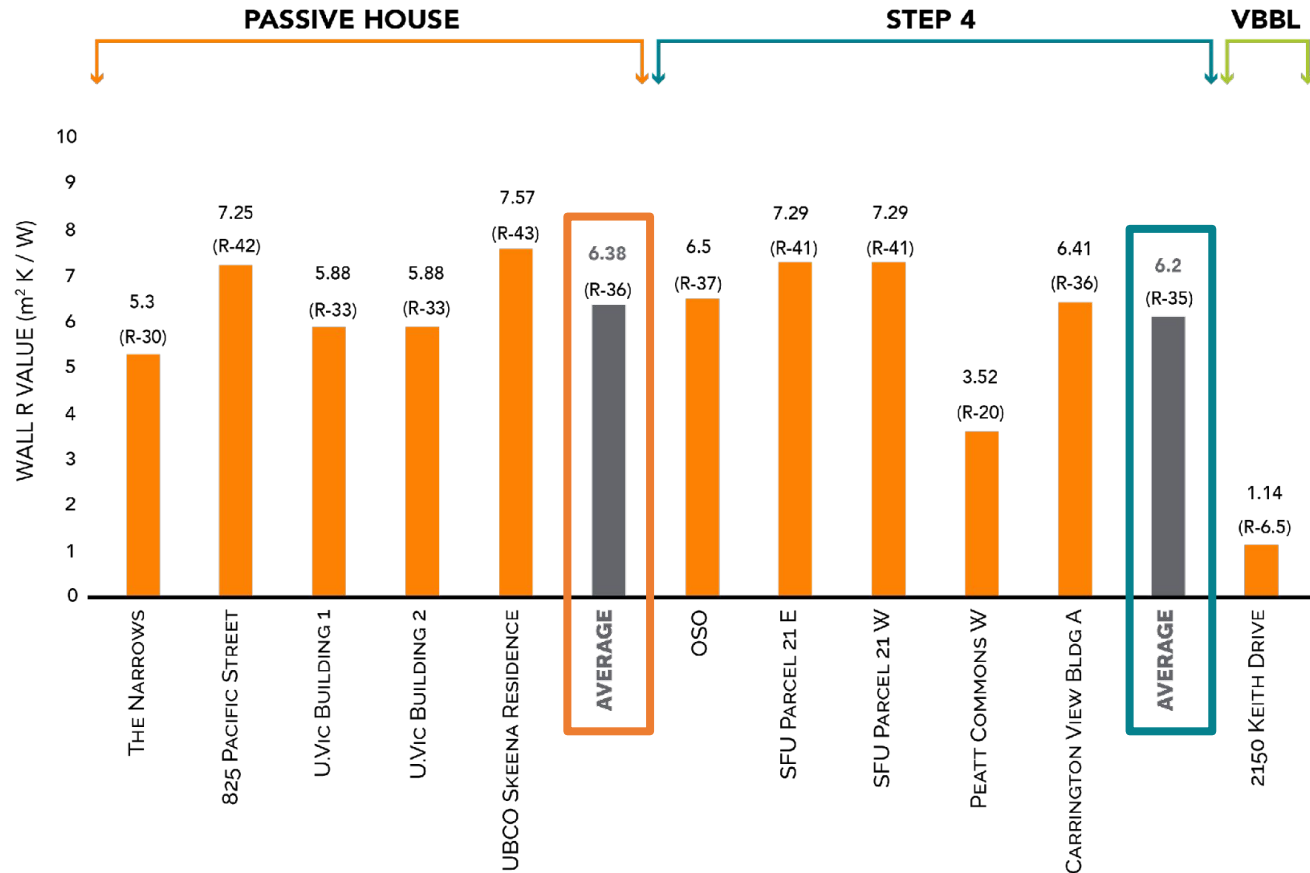
CLEANBC NZER CHALLENGE



EXTERIOR WALL INSULATION



825 Pacific Street, Vancouver B.C.

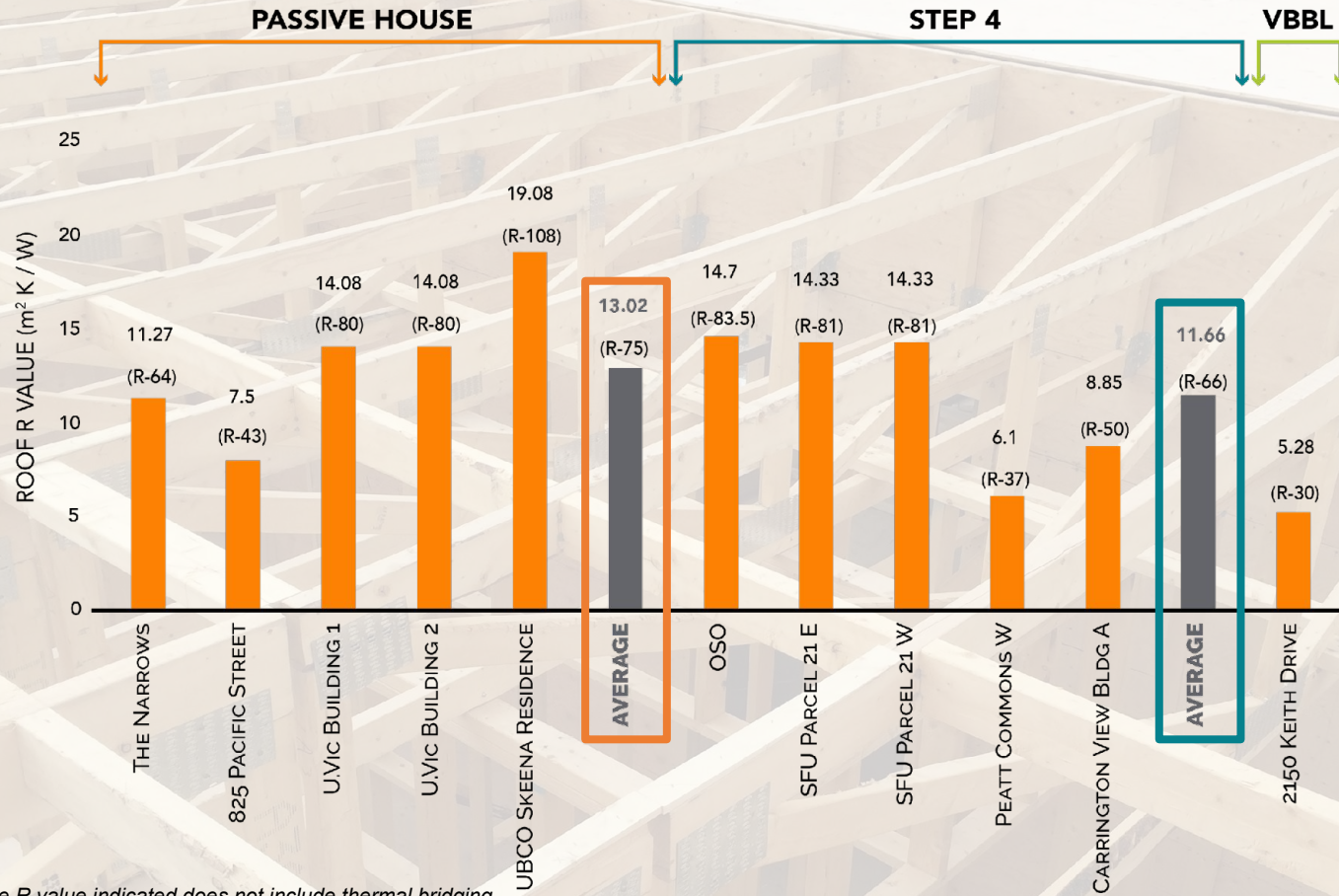


Note: The effective R value indicated does not include thermal bridging

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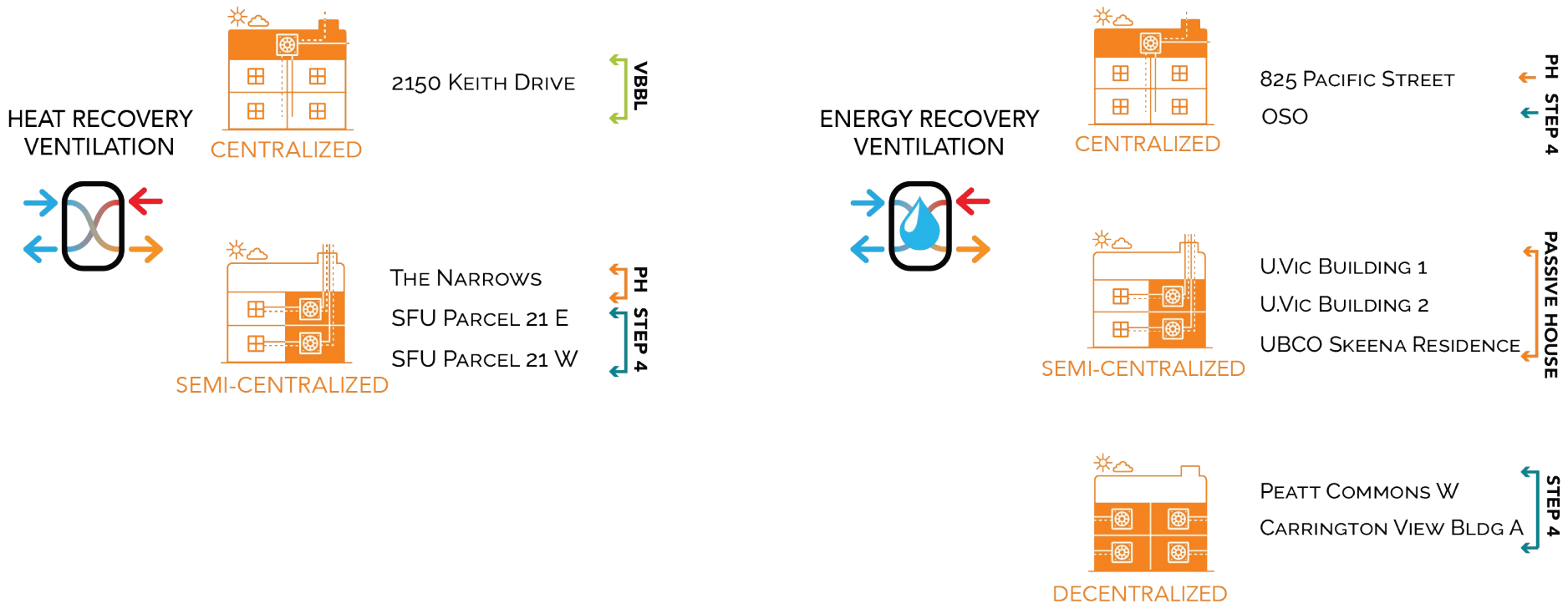
ROOF INSULATION



Note: The effective R value indicated does not include thermal bridging



VENTILATION SYSTEM



HVAC SYSTEM DESIGN

INTEGRATED
HEATING/COOLING AND
VENTILATION SYSTEM



6 OUT OF 11

THE NARROWS
U.Vic BUILDING 1
U.Vic BUILDING 2
OSO
SFU PARCEL 21 E
SFU PARCEL 21 W



SEPARATE
HEATING/COOLING AND
VENTILATION SYSTEM



5 OUT OF 11

825 PACIFIC STREET
UBCO SKEENA RESIDENCE
PEATT COMMONS W
CARRINGTON VIEW BLDG A
2150 KEITH DRIVE



CLEANBC NZER CHALLENGE



Summary

- The average window-to-wall ratio of the Passive House projects is only 5% less than the average of the Step 4 buildings.
- The average clear field thermal performance of the exterior walls is slightly higher in the Passive House buildings.
- SFU Parcel 21 was initially aiming for the Passive House standard so many of its building assemblies are in excess of what would be typical of a Step 4 building.
- Peat Commons West was able to achieve Step 4 with an average window U-value of $0.88 \text{ W/m}^2\cdot\text{K}$, a window-to-wall ratio of 32% and exterior walls with a thermal performance of only R-20.
- Less efficient ventilation systems force the building enclosure towards higher performance requirements. Investing in a high-efficiency ERV or HRV is more economical than compensating for a less efficient ERV/HRV by improving the thermal performance of the building envelope.
- Decentralized heating, cooling and ventilation systems, requiring many building envelope penetrations, were chosen for the only two apartment buildings in the set of nine projects.
- Integration of heating and cooling with the ventilation system is more feasible in high-performance buildings. In this group of buildings, four projects have integrated the heating and cooling systems with either centralized or semi-centralized ventilation systems.