

Key Concerns

- No true definition of net-zero within the bill.
- Requirement to be “solar ready.”
- Option for local jurisdictions to adopt a reach code instead of state energy code.
- Makes building homes costlier during our housing affordability crisis, and more difficult to install compliant products like solar panel wiring.

How much does it cost to be net-zero?

- Depends on the definition of net-zero.
- Depends on builder expertise and experience. Builders new to net-zero homes will see higher costs than the costs highlighted below because of a steep learning curve, finding subcontractors familiar with the technology, and access to equipment.
- If HB 1770 passes and based on research referenced below, a home built in Washington under new building codes would cost **\$52,661 (Western WA)** and **\$56,703 (Eastern WA)** more than homes built under current codes.

*Entire house is built using fully electric appliances, is net-zero, and solar-ready. Figure would be lower if only built to net-zero ready (**\$39,571** for Western WA and **\$38,946**).*

Net-zero ready^A

Department of Energy defines net-zero ready as a high-performance home so energy efficient that all or most annual energy consumption can be offset with renewable energy.

Incremental cost for net-zero ready homes = **\$5,993 (Western WA)** and **\$5,368 (Eastern WA)**

- Does not meet first cost threshold¹, therefore cost barriers to building net-zero ready homes exist.

Net-zero^A

Defined by the Rocky Mountain Institute, net-zero homes are highly efficient and produces as much renewable energy as it consumes over the course of the year. Net-zero homes don't need to be all electric (not required by DOE's ZERH program) but often are fully electrified.

- Not all homes can be built to net-zero standards (depends on many factors such as excessive roof shading due to trees, urban locations, and roof design).
- Net-zero homes requires additional independent verification (DOE ZERH certification or similar certification) to ensure that homes will performance as intended. This adds even more cost and can vary on energy verifier consulting rates.

Incremental cost for net-zero homes = **\$19,083 (Western WA)** and **\$23,125 (Eastern WA)**

- Resale threshold² is met for Western WA but not Eastern WA. This means those in Eastern Washington net-zero homeowners may not make the money back that they invested into their net-zero home.
- Customer willingness to pay threshold³ is not met in either Western or Eastern Washington.
- First cost threshold is not met, cost barriers to building ZE homes exist.

Solar ready^A

Incremental cost for net-zero homes with ITC (solar investment tax credit) = **\$19,083**

- Solar PV doesn't help with energy resilience currently because most grid-tied solar PV systems are designed to turn off during power outages.
- Upgrades exist for secure power supply investors, allowing solar PV systems to supply energy to net-zero homes during grid outages. The cost is approximately \$400. However, it only provides power when solar PV system is producing energy, and it can only supply a set amount of power. That means net-zero homes would be without power at night and wouldn't support 100% of energy use in the home.
- Combating this problem requires energy storage systems which range from \$7,900 – \$14,600. This would represent an added cost to homeowners that choose to install this product.

Whole Home Electrification

- Constructing all electric homes will add **\$14,495** onto the final sales price of a home.
 - Costs include cold-climate heat pump, heat pump water heater, two EV charging circuits, a second electrical panel (required for a second EV circuit), and an induction cooktop (induction cookware is not included).
- Payback period for fully electric house is 44 to 60 years, compared to gas which is less than 10 years.
- Eastern Washington residents will have to purchase more expensive electric equipment that can withstand harsher winters and will have to pay \$650 more in utility bills per year compared to high-efficiency gas equipment.
- Retrofit cost of electrification for existing gas homes is approximately **\$28,491**.
 - Additional cost for induction cooktops (\$1,091-1,157), installation of electric vehicle charger circuit (\$1,266-1,343), and electrical service upgrade (upwards of \$20,000).
- The median life expectancy of most gas equipment tends to be longer than electric counterparts
 - Gas furnace (20 years) versus heat pump (15 years)
 - Tankless gas water heater (20 years) versus heat pump water heater (12 years)
 - Conventional gas and electric storage-type water heaters have about the same life expectancy (10-13 years)

Sources

^A Petersen, Alisa, Michael Gartman, and Jacob Corvidae. The Economics of Zero-Energy Homes: Single-Family Insights. Rocky Mountain Institute, 2019. www.rmi.org/economics-of-zero-energy-homes

^B Home Innovation Research Labs: Cost and Other Implications of Electrification Policies on Residential Construction. February 2021. <https://www.nahb.org/-/media/NAHB/nahb-community/docs/committees/construction-codes-and-standards-committee/home-innovation-electrification-report-2021.pdf>

Definitions

¹ **First Cost Threshold:** This threshold compares the incremental cost to build a net-zero and net-zero ready homes with an identical home that meets local energy codes. If the first cost threshold is achieved, a net-zero and net-zero ready home will cost the same to build as a code-compliant home. If this threshold is achieved, the cost barrier to building net-zero and net-zero ready homes has been eliminated.

² **Resale Threshold:** This threshold compares the incremental cost to build net-zero and net-zero ready homes (compared with an identical home that meets local energy codes) with the net-present value of the anticipated energy savings over the typical length a homeowner is expected to stay in the home (which is 12 years).

³ **Customer Willingness to Pay Threshold:** This threshold compares the incremental cost to build net-zero and net-zero ready homes (compared to an identical home that meets current local energy codes) with the first cost premium customers have state they're willing to pay.