

ZERO ENERGY RESOURCE GUIDE



A new guide for building greener, healthier homes that save the planet, while saving money.

We spend over 90% of our time indoors. So with more and more people working from home in addition to raising their families there, it's not surprising that interest in building Zero Energy homes is growing.

Zero Energy homes are constructed to the highest level of energy efficiency and air quality, and only use energy that is offset by solar or other renewable energy sources. They typically use 50% - 70% less energy than traditional homes. Plus, they're not only friendly to the environment, but to a homebuyer's health as well.

This EPB Zero Energy Resource Guide includes ways to save energy and money for the homes you build – and make them more attractive to homebuyers. The guide provides an easy checklist of products and building practices that are proven to make homes more energy efficient and increase comfort and health.

To help you follow the EPB Zero Energy Resource Guide we recommend certain material choices and low-and no-cost building practices as well as a select few budget additions such as more effective insulation, windows, and HVAC equipment.

Schedule your free consultation today.

Additionally, EPB Energy ProsSM are available to provide free consultations in following the guidelines to achieve optimal results for your homebuyers. You can schedule a free EPB Energy Pros consultation by visiting epb.com/energypros or by calling 423-648-1372.

Build the homes buyers want. We'll help.

- Homes built in accordance with the EPB Zero Energy Resource Guide can save homeowners as much as 50 to 70 percent on their energy use.
- These guidelines also give homeowners assurance of a higher indoor air quality standards.
- We'll also help contractors apply for third-party certification for programs such as the DOE Zero Energy Ready certification, EPA Energy Star certification and EPA Indoor airPlus certification; as well as take advantage of the 2021 Energy Efficiency Tax Credit.

EPB ZERO ENERGY CHECKLIST

EPB Zero Energy Resource Guide includes this streamlined, easy-to-use checklist of products and building practices to consider for new home construction.

ENVELOPE

Advanced Framing

- 2x6 studs with insulated headers AND
- California corners: technique that insulates the whole wall, leaving no gap in any corner AND
- Ladder Framing:
 - Ladders where interior walls meet exterior walls OR
 - Use of Structural Insulated Panels OR
 - Use of Insulated Concrete Forms

Windows and Doors

- U Value 0.3 or better for windows AND
- SHGC 0.25 or better for doors

Air infiltration

- Achieve < 2.0 ACH50 (number of air exchanges made in one hour)

HVAC

Ducts

- Use ductless mini splits OR
- Place ducts within a conditioned space, like a conditioned attic or crawl space

Mechanical System

- Heating Seasonal Performance Factor (HSPF) at least 8.5 for Air Conditioning units AND
- Seasonal Energy Efficiency Ratio (SEER) 15 for furnaces, water heaters, and boilers AND
- Annual Fuel Utilization Efficiency (AFUE) 90% for heat pumps

Examples that meet this standard include: Ductless mini split, ducted mini split, variable capacity heat pump, dual fuel heat pump, geothermal ground/water source heat pump

Ventilation

Use of one of the following:

- Heat Recovery Ventilator OR
- Energy Recovery Ventilator OR
- Conditioning Energy Recovery Ventilator

Thermostat

Use “smart” or programmable thermostats

Examples: Nest Thermostat, EcoBee, Honeywell Lyric, Honeywell Home

LIGHTING

Include 95% LED Lighting on the premise as counted by number of lamps in home.

HOT WATER

Choose one (or more as applicable) of the following:

- Electric Heat Pump Hot Water Heater OR
- Energy Star® rated Electric Hot Water Heater OR
- Solar Hot Water Heater

APPLIANCES

All qualifying appliances must be rated Energy Star if the builder is providing any of the following:

- Refrigerator
- Freezer
- Dehumidifier
- Humidifier
- Dishwasher
- Clothes Washer
- Clothes Dryer
- Ceiling Fans

EV READY

Provide minimum grounded, four wire, 40 A, 240 V outlet for EV Charger in a garage or on the exterior of home if a garage installation is not applicable.

AIR QUALITY

Use low/no VOC materials.

Use all of the following as applicable:

- Zero VOC paint AND
- Low or no VOC sealants, stains, adhesives AND
- Greenguard certified OR CRI Green Label Plus carpet AND
- Greenguard certified and/or use of cellulose insulation

PERFORMANCE

Must meet a HERS Model of 50 or less without solar generation on-site or 15 or less with solar on-site, including on-site or community solar or other energy modeling showing zero energy. Modeling assumptions will be confirmed by on-site inspections. EPB can perform blind analysis and determine solar share panel needs. Testing will occur at final inspection at no additional cost to builders.

SOLAR ANALYSIS & SUPPORT

An EPB Energy Pro will conduct a site visit to determine solar suitability. If on-site solar and storage is the preferred option for the home, we recommend getting estimates from at least three third-party installers, and we will be happy to review those estimates with you and answer any questions you may have. In addition, we can provide you with information about how to use community solar as a cost-effective way to use solar energy to off-set energy use.

INDOOR AIRPLUS

Indoor airPlus is a third-party certification program from the U.S. Environmental Protection Agency that ensures healthier indoor air quality by recommending certain building practices and product types. EPB will help you obtain certification for each qualifying home you build for a fee of \$150.

For more information visit [epa.gov/indoorairplus](https://www.epa.gov/indoorairplus).

FAQs

How can I use the EPB Zero Energy Resource Guide?

If you're building a home, renovating a home or simply making home improvements, you can follow EPB's Zero Energy Resource Guide recommendations. Some of the recommendations need to be considered early in the homebuilding process, but some can be adopted as renovations or home improvements are made. However, any of the Zero Energy recommendations you follow will help make your home more energy efficient and can improve air quality.

What kinds of recommendations are included in the EPB Zero Energy Resource Guide?

EPB's cost-effective recommendations include building materials such as advanced framing materials, certain doors & windows, and air filtration systems. The Guide also includes specific HVAC system recommendations, appliance specifications, lighting and air quality measures. Other tips address renewable energy readiness, including EV charging outlets and solar energy analysis and support. An EPB Energy Pro will be happy to answer any questions. You can schedule a free Energy Pro consultation by visiting epb.com/energypros or calling 423-648-1372.

Will EPB help me follow the EPB Zero Energy Resource Guide recommendations?

Absolutely! EPB Energy Pros are standing by free of charge to consult with you on EPB Zero Energy recommendations, or anything energy related. To schedule a free EPB Energy Pros consultation, visit epb.com/energypros or call 423-648-1372.

Why should I use the EPB Zero Energy Resource Guide?

As more and more homebuyers look for energy efficient homes, Zero Energy homes will give homebuilders and existing homeowners a sales advantage over traditionally-built homes. There are also tax incentives available to homebuilders for energy efficient homes built above and beyond EPB's Zero Energy recommendations. The 2021 Energy Efficiency Tax Credit gives a \$2,000 incentive to builders for each new home construction that meets a 50% energy efficient standard and \$1,000 per manufactured home that meets a 30% energy efficient standard.

I have an existing home. Can it be upgraded using Zero Energy recommendations?

You can always follow these cost-effective recommendations to improve energy efficiency and indoor air quality in your home. EPB Zero Energy Resource Guide recommendations can be followed individually, when you renovate a home or as you make home improvements, or all at once during new home construction. EPB Energy Pros will be happy to help you every step of the way at no cost. To schedule a free EPB Energy Pros consultation, visit epb.com/energypros or call 423-648-1372.

Do “Zero Energy Homes” really save on energy costs?

Yes! For example, EPB, Habitat for Humanity, and green I spaces worked together to implement these measures on a Habitat Home in 2019. The home included 98% of the recommendations outlined in this EPB Zero Energy Resource Guide. One year after completion, the homeowner reported energy savings of \$230 annually over their previous apartment (the equivalent of \$500 annually over the average residential bill in EPB’s service territory). In addition, they reported fewer allergy symptoms and better overall health. Plus, they were able to adopt cost-effective EPB Solar Share panels to offset the grid electricity needed for the home.

Are solar panels leased from EPB’s Solar Share program part of EPB’s Zero Energy Resource Guide?

Yes. EPB’s guidelines include Solar Analysis & Support to help customers offset their home’s energy use using renewable energy. Our recommendations may include leasing panels from EPB’s Solar Share program as a cost-effective way to utilize solar without having to install solar panels on their home. And, for homebuilders and homeowners interested in rooftop solar, EPB Energy Pros will consult with them to determine if a solar panel installation is the right option for a particular home and even review contractor estimates so they get the best solution.

What is the difference between a Net Zero Energy home and EPB’s Zero Energy Resource Guide?

Typically a “Net Zero Energy” home refers to a residence that utilizes onsite renewable energy generation, such as solar energy, to offset its energy use. The EPB Zero Energy Resource Guide simply recommends solar energy to help offset energy use. For homebuilders and homeowners interested in rooftop solar, EPB Energy Pros can consult with them to determine if a solar panel installation is the right option for a particular home and even review contractor estimates so they get the best solution. Or, customers may utilize EPB’s Solar Share community solar as a cost-effective and convenient way to utilize solar energy to offset the energy use they use without installing solar panels on a home.

How are these recommendations different from Smart Build?

Smart Build is a certification program that includes some communications standards in addition to added energy efficiency measures. Its requirements are significantly lower than Energy Star, DOE Zero Energy Ready Home, or EPA Indoor airPlus certification. EPB's Zero Energy Resource Guide simply provides recommendations for building a super-efficient, healthy home. It is not part of a certification program.

Do the recommendations offered in the EPB Zero Energy Resource Guide meet DOE Zero Energy Ready Home certification requirements?

Not at this time. While some of the EPB Zero Energy Resource Guide recommendations are similar to those of the DOE Zero Energy Ready Home program, they are not meant to satisfy certification requirements of that level. The EPB Zero Energy Resource Guide simply provides recommendations for building an efficient, healthy home as cost-effectively as possible based on best practices here in our own community. The DOE Zero Energy Ready Home program requirements are significantly higher than our recommendations. Visit <https://www.energy.gov/eere/buildings/zero-energy-ready-homes> to learn more.

Does this guide tell me how to build an Energy Star certified home?

No. Energy Star is a certification program from the U.S. Environmental Protection Agency that EPB simply administers independent of the EPB Zero Energy Resource Guide. Energy Star has rigorous energy efficiency requirements to meet that are not part of this guide. The EPB Zero Energy Resource Guide is simply a list of recommendations based on cost-effective best practices for saving energy here in our community, and not part of any certification program.

Does this guide tell me how to build for EPA Indoor airPlus?

No. Indoor airPlus is a third-party certification program from the U.S. Environmental Protection Agency that ensures healthier indoor air quality by recommending certain building practices and product types. While some of the EPB Zero Energy Resource Guide recommendations are similar to those of the EPA Indoor airPlus program, they are not meant to satisfy certification requirements of any kind.

Are DOE Zero Energy Ready Home and EPA Indoor airPlus certification standards part of the EPB Zero Energy Resource Guide?

There are some recommendations in the EPB Zero Energy Resource Guide that are similar to the more comprehensive DOE Zero Energy Ready Home and EPA Indoor airPlus certification standards. However, EPB's recommendations are not intended to meet the requirements of any certification program. They are simply cost-effective tips for building homes with increased energy efficiency and air quality based on best practices here in our community.

Who can get a 2021 Energy Efficiency Tax Credit?

Only contractors may receive 2021 Energy Efficiency Tax Credits.

How much is the 2021 Energy Efficiency Tax Credit?

Qualified contractors can receive a credit of \$2,000 for a home that is certified to have an annual level of heating and cooling energy consumption at least 50% below that of a comparable home. It also must include building envelope component improvements that account for at least 1/5 of the 50% reduction in energy consumption.

Do manufactured homes qualify for the 2021 Energy Efficiency Tax Credit?

Yes, they can. A manufactured home meeting the requirements described above and the Federal Manufactured Home Construction and Safety Standards (FMHCSS) requirements is also eligible for the \$2,000 credit. There is also an available credit of \$1,000 for manufactured homes that don't meet the 50% energy saving requirement, but are certified to have an annual level of heating and cooling energy consumption of at least 30%.

What do contractors have to do to get the 2021 Energy Efficiency Tax Credit?

The home you build should meet the minimum requirements as outlined by the IRS here. An EPB Energy Pro will perform a site visit at your completed home to perform a HERS rating and then send the results off to a third-party certifier for verification. For a fee of \$350, we'll also provide you with this documentation to file with the IRS for the tax credit. You'll need to complete the necessary forms and documentation and have your home certified.