Best Practices for the Development of Zero Energy Ready Homes in the Affordable Housing Market

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Part I
The Benefits of Zero Energy Ready Homes in the Affordable Housing Sector

In recent years, the concept of zero energy ready homes has gained traction as a promising solution to address both environmental sustainability and affordability in housing. These homes are designed to be highly energy efficient, resulting in minimal or net-zero energy consumption over the course of a year. When implemented in the affordable housing sector, zero energy ready homes offer a multitude of benefits that extend beyond just economic savings.

Environmental Sustainability:
One of the most significant advantages of zero energy ready homes is their positive impact on the environment. By significantly reducing energy consumption, these homes contribute to lower greenhouse gas emissions and help mitigate climate change. The incorporation of renewable energy sources such as solar panels further enhances their environmental credentials, enabling these homes to operate independently from traditional fossil fuel-based energy grids. This reduction in carbon footprint aligns with global efforts to transition towards more sustainable living environments.

Cost Savings for Residents:
Affordable housing often comes with higher energy burdens due to older, less efficient building designs. Zero energy ready homes alleviate this burden by drastically reducing or eliminating utility bills. Lower operational costs mean residents can allocate more of their income towards other essential needs such as healthcare, education, or savings. Over time, the initial investment in energy-efficient technologies pays off through long-term savings, making these homes financially viable for low-income families and individuals.

Improved Indoor Comfort and Health:
The design principles of zero energy ready homes prioritize superior insulation, advanced ventilation systems, and high-performance windows. These features not only minimize energy loss but also enhance indoor air quality and comfort. Proper ventilation reduces the risk of indoor pollutants and allergens, promoting a healthier living environment for residents. Consistent indoor temperatures throughout the year provide additional comfort benefits, especially in regions with extreme weather conditions.

Community Resilience:
In times of energy shortages or natural disasters, zero energy ready homes equipped with energy storage systems and resilient design features can continue to function independently.

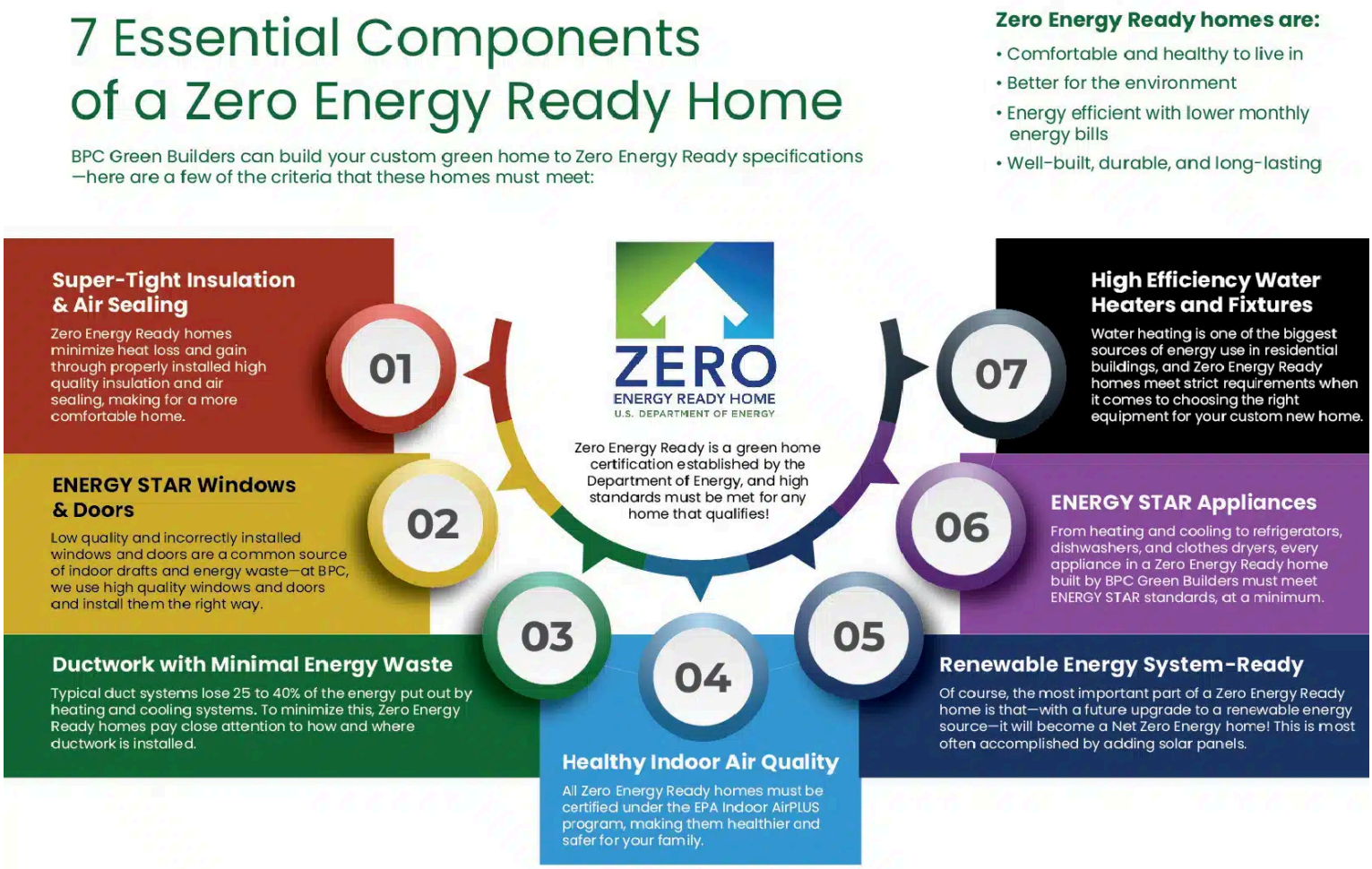
This resilience reduces reliance on external resources and enhances community stability during crises. Moreover, these homes can serve as models for sustainable development within the broader community, inspiring similar initiatives and fostering a culture of environmental stewardship.

Job Creation and Economic Development:
The construction and retrofitting of zero energy ready homes create job opportunities within the green building sector. These jobs range from skilled labor in construction to engineering and design roles focused on energy efficiency technologies. Furthermore, the adoption of sustainable building practices stimulates local economies by increasing demand for eco-friendly building materials and services.

Policy and Regulatory Advancements:
The implementation of zero energy ready homes in the affordable housing sector encourages governments and policymakers to prioritize energy efficiency standards and incentives. Subsidies, tax credits, and grants aimed at promoting sustainable housing solutions become more prevalent as the demand for zero energy ready homes grows. This regulatory support further lowers the barriers to entry for developers and encourages widespread adoption across different socioeconomic demographics.

Part II
Key Benchmarks for Certifications

A DOE Zero Energy Ready Home is a high-performance home that is so energy efficient that a renewable energy system could offset most or all the home's annual energy use. Each DOE Zero Energy Ready Home meets rigorous efficiency and performance criteria found in the DOE Zero Energy Ready Home National Program Requirements. Most types of new homes in the U.S. are eligible to participate in the DOE Zero Energy Ready Home program, and the homes are verified by a qualified third-party as part of the certification process.



construction process and ultimately the commissioning of the Net Zero Ready Home through the DOE.

The Third Party Rater (TPR) expects the builder to be knowledgeable of the construction and inspections process. The builder is responsible for scheduling the TPR at specific points in the construction process for inspections. Inspections include:

- Preliminary Testing Recomended
    - Whole house air tightness
    - Duct Leakage

There are key metrics that must be met or exceeded for the home to certified with the DOE as Net Zero Ready. A prerequisite to this certification is that the home must be EPA Energy star certified and all Energy star certifications must be met. In addition to all energy star standards the home must meet or exceed the following to be certified Net Zero Ready:

- Inspection of all insulation and photos by TPR
- Duct Leakage test by TPR
    - 4% leakage to outside or lower
    - 8% Leakage or lower for ducts within conditioned space
- Preliminary Testing Recommended

    - Whole house tightness (blower door)
    - Duct Leakage test
    - Ventilation Rates and wattage
- Air sealing / Certification specialist
- Energy Star Ventilation Requirements
    - Bathrooms= 20 cfm continuous draw or 50 cfm intermittent
    - Kitchen = *25 cfm continuous draw or 100 cfm intermittent
        - *if using a recirculating hood in conjunction with ERV exhaust, Whole house airtightness must be ≤ 1.00 ACH50
- Ventilation Balancing and commissioning
    - Secure a contractor to do this work
    - Alternately, produce equipment and balance in house
- HVAC Design requirements
    - Load calc, equipment selection and duct designed by 3rd party certified HVAC designer and meet energy star standards
    - HVAC Design must be included directly into plan set
- Hot Water distribution
    - .5 Gallons or less from source to furthest fixture
- Indoor Air Plus Certification is a must for Net Zero Ready
    - Review checklist- low VOC and emissions for all paint cabinetry and flooring
- Energy Star appliances are mandatory for this program

In conclusion, zero energy ready homes represent a transformative approach to affordable housing that integrates environmental sustainability with economic feasibility. By reducing energy costs, improving indoor comfort, promoting community resilience, and creating economic opportunities, these homes offer tangible benefits to residents and society at large. As the world continues to confront climate change and housing affordability challenges, zero energy ready homes emerge as a beacon of hope, demonstrating that sustainable living can be both achievable and inclusive. Their adoption in the affordable housing sector not only addresses immediate housing needs but also paves the way for a more sustainable future for generations to come.