



**BUILDING
PERFORMANCE**
ASSOCIATION

To: House Select Committee on the Climate Crisis (ClimateCrisisRFI@mail.house.gov)
From: E4TheFuture and the Building Performance Association
Re: Request for Information – Achieving Net Zero by 2050
Date: November 20, 2019

Thank you for the opportunity to submit these comments in response to the Request for Information put forth by the House Select Committee on the Climate Crisis on September 5, 2019. As leaders in the residential energy efficiency industry, E4TheFuture and the Building Performance Association support the goal of net-zero emissions by 2050 and we look forward to working with the Select Committee to inform policy recommendations to meet that goal.

E4TheFuture is a non-profit 501(c)3 organization which collaborates with industry stakeholders to provide expert policy solutions, education, and advocacy to advance residential clean energy and energy efficiency solutions on the federal, state and local level.

The Building Performance Association (BPA), formerly known as the Home Performance Coalition, is a membership-driven 501(c)6 industry association dedicated to advancing the home and building performance industry by delivering improved energy efficiency, health, safety, and environmental performance of buildings through our key stakeholders. BPA supports home performance contractors, weatherization agencies and training centers, product manufacturers and distributors, program sponsors and implementers, building scientists, and non-profits focused on residential and commercial energy efficiency.

We appreciate the Select Committee's interest in gathering information on a series of questions covering Sector-Specific Policies, including Buildings; Cross-Cutting Policies, including Innovation; and Resilience and Adaptation. Given our extensive work and experience in residential energy efficiency and our knowledge of the industry, we are pleased to offer the following comments on a subset of those questions.

Sector-Specific Policies

1. What policies should Congress adopt to decarbonize the following sectors consistent with meeting or exceeding net-zero emissions by mid-century? Where possible, please provide analytical support that demonstrates that the recommended policies achieve the goal.

d. Buildings

Buildings are responsible for 31% of all U.S. greenhouse gas emissions,¹ and are therefore critical to any emissions reduction strategy. There is significant opportunity to decarbonize the buildings sector by adopting policies that advance energy efficiency.

¹ Total combined emissions from the residential and commercial sectors with electricity-related emissions distributed. <https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf>

Energy efficiency is a critical pathway to achieving deep decarbonization because it is cleaner and cheaper than building new low-carbon or carbon-free generation. By reducing base load in homes and other buildings, energy efficiency also allows renewables to go further and meet a larger portion of energy demand in the building sector. Deployment of energy efficiency across the U.S. economy would reduce primary energy demand and generating capacity needs and therefore lower the overall costs of shifting to a low-carbon energy system.² Ultimately, the cleanest and cheapest energy is the energy you don't have to produce in the first place. A new report from ACEEE found that energy efficiency alone can cut U.S. energy use and greenhouse gas emissions in half by 2050.³ Buildings deliver 33% of the total emissions reductions in the report's model, and upgrades to existing buildings and homes, zero energy new buildings and homes, and appliance and equipment efficiency are identified as some of the greatest cost-effective opportunities to achieve these reductions.

The residential buildings sector in particular remains a largely untapped resource for carbon reduction goals. Residential buildings account for 21% of total U.S. energy consumption,⁴ consume more electricity than any other sector,⁵ and are the largest contributor to peak demand,⁶ all of which make this sector particularly important from a carbon emissions reduction standpoint. The Home Performance Coalition published a report in 2016 which outlines how residential energy efficiency can play an important role as a proven, low-cost, and accessible way to help meet carbon emission reduction goals.⁷ The residential buildings sector is often overlooked by policymakers because of its diversity and challenges: over 70% of our nation's housing stock was built before 1990, with almost 40% older than 1970,⁸ and the characteristics of homes vary considerably by the year they were built, meaning they need individualized attention. Retrofitting these homes could achieve significant energy and carbon savings. However, each house is unique and the barriers that exist in terms of financing, homeowner education and engagement, and proper valuation of efficiency characteristics of residential buildings all make it a difficult sector to tackle from a policy perspective. The following pieces of legislation and policy proposals represent a multi-pronged policy approach to reducing carbon emissions in the residential building stock:

Legislation

Home Owner Managing Energy Savings (HOMES) Act of 2019 (116th – HR 2043, Rep. Welch). Would establish a grant program for rebates to make residential energy efficiency upgrades with a network

² An NRDC study found that 80% emissions reductions in the U.S. by 2050 is achievable and cost-effective using existing clean energy technologies. Energy efficiency is the single greatest contributor to emissions reductions in the model scenario which assumes an aggressive, but technically and economically achievable, deployment of energy efficiency across the U.S. economy. <https://www.nrdc.org/sites/default/files/americas-clean-energy-frontier-report.pdf>

³ <https://aceee.org/sites/default/files/publications/researchreports/u1907.pdf>

⁴ <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>

⁵ https://www.eia.gov/electricity/annual/html/epa_01_02.html

⁶ https://www.energy.gov/sites/prod/files/2019/04/f61/bto-geb_overview-4.15.19.pdf

⁷ https://www.building-performance.org/sites/default/files/A%20Policymaker%E2%80%99s%20Guide%20to%20Incorporating%20Existing%20Homes%20into%20Carbon%20Reduction%20Strategies%20and%20Clean%20Power%20Plan%20Compliance_0.pdf

⁸ <https://www.eia.gov/consumption/residential/data/2015/hc/php/hc2.3.php>

of rebate aggregators, quality assurance, and pilot on pay for performance. Earlier iterations of the HOMES Act from previous Congresses have been bipartisan with Rep. McKinley (R-WV).

Access to Consumer Energy Information Act or the E-Access Act (116th – discussion draft, Rep. Welch) (114th – HR 1980/S 1044, Rep. Welch (D-VT), Rep. Cartwright (D-PA) / Sen. Markey): Would allow DOE to facilitate customers’ access to their own electricity data, adds consumer access to energy use and price data to State energy conservation plans, and provides for establishment of voluntary guidelines with access to third parties according to a protocol established by the Secretary.

Residential Energy Efficiency Valuation Act “REEVA”: A short term grant program to states to provide incentives based on measured energy savings from energy efficiency upgrades of residential buildings. Payments are to contractors/aggregators based on performance. The contractor/aggregator is to utilize financing to provide market-based incentives for their customers. *Language available from the Building Performance Association.*

Sensible Accounting to Value Energy (SAVE) Act (114th – HR 614/ 113th – S 1106, Rep. Murphy, Rep. Jolly / Sen. Bennet, Sen. Isakson): HUD to develop and issue guidelines to all federal mortgage agencies to implement enhanced loan eligibility based on energy cost savings due to efficiency upgrades. Supported by the NAHB and many others. Included in the Energy Savings and Industrial Competitiveness Act (HR 3962, S2137).

Blue Collar to Green Collar Jobs Development Act of 2019 (116th – HR 1315, Rep. Rush): Would establish an energy workforce grant program, which would provide assistance to businesses in the energy efficiency and renewable energy industries that are seeking to educate and train new hires and existing employees. Similar to S 2393, Clean Energy Jobs Act (Sen. Heinrich).

Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (HR 2041, Rep. Tonko, Rep. Rush, Rep. Kaptur): Would reauthorize and make updates to the Weatherization Assistance Program. This bill has passed out of Committee this year and awaits a floor vote.

Additional Policy Proposals

Tax credit. We recommend support for tax incentives for homeowners that invest in sound residential energy efficiency home upgrades; tax incentives like a forward-looking, expanded 25C tax credit. The 25C tax credit is the only energy efficiency tax credit provided to consumers, everyday homeowners who struggle to pay their utility bills. Residential tax incentives are critical to reducing the upfront cost of energy efficiency improvements, thereby allowing more Americans access to the efficiency market, reducing monthly utility bills, increasing the health and safety of homes, and reducing carbon emissions. We support a forward-looking extension of a tax credit for residential energy efficiency upgrades and recommend improving the 25C credit by updating goals and transitioning the credit into a permanent performance-based instead of prescriptive incentive.

Energy Efficiency Resource Standard (EERS). Direct electric and natural gas utilities to achieve increasing levels of energy savings through cost-effective customer energy efficiency programs.⁹ States could administer the program, and limited credit trading would be allowed. While traditional EERS models set resource-specific savings targets, a national standard could be designed more flexibly with an overarching GHG emissions reduction goal, which would allow for beneficial electrification where clean electricity replaces direct fossil fuel use to reduce emissions.¹⁰

Efficiency Requirements for New Homes with Assisted Loans. Update HUD/USDA/VA efficiency requirements for new homes with assisted loans and public housing. Federal agencies have efficiency requirements for new homes with federal loan guarantees and federal loans, as well as public housing with federal assistance. However, FHA loans are still using the 2009 IECC, and some others the 1992 MEC. Should update EPA Act 1992/EISA legislative authorities to refer to most recent code and clarify administrative update requirements.

Pay for performance (P4P) is a measured savings model through which incentives are given based on realized energy savings, rather than upfront payments for deemed savings attributed to a particular technology or measure. P4P can take a range of different forms—including different design features, administrators, and payment structures—but it generally entails shifting risk to a third-party service provider or aggregator whose payment depends on actual performance (i.e., measured and verifiable energy savings). This shift brings market forces to bear to discover the best solutions that deliver persistent savings. Vendors that can deliver the most energy savings with their technology, reward system, or other approach for the least cost will provide the least expensive kWh of savings. This model offers important flexibility to target different homes with unique approaches while ensuring accountability. To date, there are few active residential P4P programs, so the models are evolving. While P4P is still being tested, new software abilities and data access mean the potential is enormous. The model offers an opportunity for incentivizing solutions delivered where and when they are needed most to support the grid of the future. Because P4P is technology-agnostic and based on outcomes rather than prescriptive measures, the paradigm could encourage the use of multi-measure approaches (different technologies and solutions) that work together to make homes more energy efficient and achieve carbon reductions. Congress should adopt policies and legislation that help advance a pay-for-performance model for residential energy efficiency, like the pilot program included in the 116th version of the HOMES Act and the REEVA discussion draft (described above).

2. What policies should Congress adopt to ensure that the United States is a leader in innovative manufacturing clean technologies; creating new, family-sustaining jobs in these sectors; and supporting workers during the decarbonization transition?

⁹ According to ACEEE analysis, a federal EERS of 20% electricity and 12% natural gas savings by 2030 would save utility customers nearly \$150 billion on their energy bills and would achieve CO₂ emissions reductions equivalent to taking nearly 50 million cars off the road. <https://aceee.org/policy-brief/energy-efficiency-resource-standard-eers>

¹⁰ ACEEE recently published “Next-Generation Energy Efficiency Resource Standards” which looks at new EERS approaches that can help meet aggressive climate goals, along with delivering cost, grid and equity benefits. <https://aceee.org/sites/default/files/publications/researchreports/u1905.pdf>

Policies that Advance Energy Efficiency Create Jobs

Energy efficiency is the largest employer and fastest growing sector in the energy industry. Put simply, energy efficiency equals jobs. According to this year's "Energy Efficiency Jobs in America"¹¹ report released by E4TheFuture, the energy efficiency sector employs 2.3 million Americans, twice as many workers as the entire U.S. fossil fuel industry, and energy efficiency is leading the nation's energy economy in new job creation, accounting for half of the entire energy industry's job growth in 2018. These local, family-sustaining jobs exist all across the country. In fact, the E4TheFuture report found that 99.7% of U.S. counties have energy efficiency jobs and more than 300,000 of these jobs are in rural areas. A significant portion of energy efficiency jobs in the U.S. are in the residential sector, and approximately 56 percent of energy efficiency jobs involve construction and repairs. These are the contractors – the "boots on the ground" – installing energy efficiency products and technologies and working to reduce energy waste in homes and buildings across the country. These jobs are, by their very nature, inherently local and cannot be exported. Policies that encourage investment in energy efficiency can further advance growth in this industry, creating even more well-paying jobs all across America and generating economic opportunity through the decarbonization transition.

Importantly, policies that provide incentives for building efficiency retrofits, such as the HOMES act or tax policy like the 25C federal credit, create a ripple effect on jobs. Demand for insulation, air sealing, HVAC will certainly create work for those who install these products, but it also creates jobs in the manufacturing and distributing of those products. This creates jobs around those industrial centers where workers eat, shop, and live.

Not only is energy efficiency the largest employer in the energy sector, it has the most potential for even more job growth moving forward. With an aging building stock across the country we have only scratched the surface on investing in energy efficiency improvements. Addressing barriers to retrofitting these existing homes and buildings and advancing energy efficiency across the entire buildings sector will simultaneously support decarbonization and job creation. See list of legislation and policy proposals to advance residential energy efficiency in #1.

Workforce Development Would Support Transitioning Workers and Small Businesses

The energy efficiency industry is comprised mainly of small businesses. The 2019 "Energy Efficiency Jobs in America" report found that nearly 80% of energy efficiency businesses in America have fewer than 20 employees.¹² These small businesses are the heart of the American economy—creating jobs, driving growth, and saving us all money through improved energy efficiency. They are also the ones that are in need of assistance when it comes to ensuring that there are qualified workers to fill these jobs. Small energy efficiency businesses need resources to help train new hires and provide ongoing education to existing employees, keeping them up to date on certifications and trained in the latest technologies and health and safety practices. To prepare more American workers for quality jobs in energy efficiency and drive further growth in this industry, Congress should act to support workforce development and jobs training.

¹¹ <https://e4thefuture.org/wp-content/uploads/2019/09/Energy-Efficiency-Jobs-in-America-2019.pdf>

¹² Ibid.

A comprehensive, nationwide program is needed to improve education and training for workers in the energy efficiency industry, including manufacturing, engineering, construction, and building retrofitting jobs. This is exactly what the ***Blue Collar to Green Collar Jobs Development Act of 2019 (HR 1315)*** would create. One of the main pillars of HR 1315 is an energy workforce grant program, which would provide assistance to businesses in the energy efficiency and renewable energy industries that are seeking to educate and train new hires and existing employees. By covering the wages for these workers during the time they are receiving training, this grant program would significantly help small and medium sized businesses invest in their employees, allowing workers to expand their skill set, do better work, and earn higher wages in the long run.

Workforce training is key to supporting workers during the decarbonization transition and ensuring that new and transitioning workers get the qualifications necessary to fill quality jobs in the energy efficiency sector. Existing buildings are diverse and challenging to address and the quality of installation can have a significant impact on the performance of energy efficiency measures, so on-the-job training is important for new hires. Existing workers also need ongoing education and certification to keep up with advancing technology in the building efficiency sector. With more resources to provide training for these high-quality jobs, especially for small businesses that cannot afford the training, the energy efficiency industry can continue to grow. HR 1315 will result in more American workers who are equipped to provide energy efficiency products and services and whose work will reduce energy waste and save money for homes and businesses across the country. Importantly, the legislation would give priority to eligible businesses that recruit employees from local communities, minorities, women, foster children, persons who are transitioning from fossil energy sector jobs, and veterans; and would support critical on-the-job training and reskilling for workers.

Federal Investment in DOE Programs Drives Innovation, Jobs, Savings

Dollar for dollar, federal investments in energy efficiency create more jobs than investment in the utility sector or fossil-fuels,¹³ and federal investments in Department of Energy (DOE) programs that support energy efficiency – like the Building Technologies Office, Weatherization Assistance Program, and State Energy Program – support innovation and lead to job creation and economic growth.

The following programs at DOE deserve the support of the American taxpayer as these programs are proven to provide a significant return on investment. When funded they will continue to provide energy cost relief to households, support American-based industry and American jobs, ameliorate issues with the aging electrical grid, and support national security goals.

- **Building Technologies Office (BTO), which develops critical technologies, tools, and solutions that help U.S. consumers and businesses achieve peak efficiency performance in new and existing homes and buildings across all sectors of our economy. Programs like Home Performance with Energy Star, which advances contractor engagement in high efficiency equipment installations, and Home Energy Score, which helps ensure that energy efficiency is valued in real estate transactions – are just two examples of crucial residential programs within BTO. The Residential Building Integration program within BTO has the capacity to fundamentally transform the performance of homes and greatly improve the energy efficiency in the 115 million existing residential buildings throughout this country. We recommend funding**

¹³ ACEEE. N.d. Energy Efficiency and Economic Opportunity. Retrieved from <http://aceee.org/files/pdf/fact-sheet/ee-economic-opportunity.pdf>

be focused on facilitating later-stage research, demonstration, and widespread deployment of technology solutions in new and existing homes, with an emphasis on whole-house energy efficiency retrofits (including outreach, engagement and training to private sector contractors) and continuing efforts to advance smart home technology. BTO's programs can significantly improve the energy efficiency in the residential sector through its partnerships with the thousands of small businesses in this sector, the construction trades, equipment, smart grid technology and systems suppliers, integrators and state and local governments. We encourage the direct engagement with residential contractors and businesses, which are crucial to the success of buildings programs.

- **State Energy Program (SEP)**, which provides funding and technical assistance to states, territories, and the District of Columbia to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. Over the past 30 years, SEP has proven to be the critical link in helping states improve efficiency in hospitals and schools, establish business incubators and job training programs, and establish relationships with energy service companies and small businesses to implement cost-effective energy efficiency programs across their state. The Oak Ridge National Laboratory found that every dollar invested in SEP by the federal government yields over \$10 leveraged for energy-related economic development and realizes \$7.22 in energy cost savings for U.S. citizens and businesses – a tremendous economic value. SEP provides extraordinary value and flexibility, which is why governors across the country strongly support continued funding. It is important to note that SEP defers to the governors all decisions on allocating resources provided by DOE to meet their states' priorities such as energy emergency planning and response and energy related economic development.
- **Weatherization Assistance Program (WAP)**, which helps low-income and rural families, seniors, and individuals with disabilities make lasting energy efficiency improvements to their homes. WAP has a proven track record of creating new jobs and contributing to the economy through the program's large supply chain of vendors, suppliers, and manufacturers. Since 1976, WAP has helped make more than 7 million homes more efficient, saving the average recipient about \$4,200 over the lifetime of their home. A peer-reviewed study from the Oak Ridge National Laboratory found that the program is cost-effective at even conservative levels of evaluation. Each dollar that goes toward weatherization assistance yields at least \$2.30 in benefits, and by some estimates as much as \$4.10 to the home and society.

Aside from the very important programs noted above, we recommend Congress do everything in its power to support the later-stage research and development, field validation, deployment, demonstration, consumer education, and technical assistance activities performed within the Office of Energy Efficiency and Renewable Energy (EERE). While the Administration continues to place an emphasis on early-stage research activities within EERE, if the results of that early-stage research are not then integrated and pushed out into the market through demonstration and deployment activities, these innovative energy technologies, practices, and information cannot be fully utilized by American consumers and companies to reduce carbon emissions. This is particularly the case with complex systems and structures such as America's homes and buildings. We urge Congress to support – and hold the Administration accountable to advancing – a comprehensive and real-world strategy that includes medium- and later-stage research, deployment, and demonstration activities that are designed to utilize the most effective means to increase buildings' energy efficiency in order to reduce carbon emissions.

DOE's residential efficiency programs and initiatives are critical to the continued advancement of the energy efficiency industry, which contributes to the country's overall economic growth, energy independence, and international competitiveness, while achieving carbon reductions.

Cross-Cutting Policies

5. Innovation:

a. Where should Congress focus an innovation agenda for climate solutions? Please identify specific areas for federal investment and, where possible, recommend the scale of investment needed to achieve results in research, development and deployment.

Within the energy efficiency industry, the building efficiency sector is undergoing rapid change and is increasingly a source of innovation and new technology. Thanks to advances in technology, our nation's buildings—and the residential sector in particular—can be enabled to play an important role in managing energy demand to support grid efficiency, reliability, and resilience and achieve significant carbon reductions. The U.S. Department of Energy (DOE) Building Technologies Office (BTO) has been doing a lot of work in the area of "Grid-interactive Efficient Buildings" (GEBs), and this is a key area to focus an innovation agenda. A new report released by the National Association of State Energy Officials (NASEO), "Residential Grid-Interactive Efficient Building Technology and Policy: Harnessing the Power of Homes for a Clean, Affordable, Resilient Grid of the Future," describes how homes with energy efficiency measures, combined with smart technologies, and small-scale storage and generation resources can support grid needs and achieve carbon reductions while consumers benefit from utility bill savings, increased comfort, and amenity. GEB technologies (e.g. smart thermostats, efficient connected appliances, battery and thermal storage, and home energy management systems) make homes smart, connected, efficient and flexible, allowing them to reduce or shift energy use to take advantage of variable renewable energy and support a cleaner grid, while helping American families lower their utility bills and increase comfort and convenience.

Energy efficiency measures are the foundation of a smart, grid-interactive efficient home. They reduce the baseline load of a home, lowering overall electricity use. Energy efficiency measures include building envelope improvements and replacement of existing equipment and systems (e.g., appliances, lighting, HVAC, boilers) with higher-efficiency models. All of these measures provide a foundation for the effectiveness of other clean energy resources and solutions by minimizing the load size that requires shifting, enabling homes to hold a comfortable temperature for longer periods of time, and ensuring distributed generation and storage are appropriately sized. Smart technologies help advance energy efficiency in buildings, driving additional savings and connecting efficiency measures with new opportunities to provide load flexibility. Smart thermostats, for example, offer monitoring, control, and optimization of HVAC systems to take advantage of energy saving opportunities (e.g., via learned schedules and low energy "away" modes) and they can also be used for demand response. When paired with other efficiency measures like a tight, well-insulated building envelope and efficient window attachments that help keep the home at a comfortable temperature, smart thermostats can adjust the setpoint slightly to save energy and ease strain on the grid—all with little to no effort from the homeowner.

Importantly, GEBs can provide energy savings and demand flexibility as a cost-effective clean energy solution that reduces carbon emissions. Smart grid-interactive technologies provide two-way communication between a home and the grid and offer new tools to target load shedding and shifting more precisely and continuously, exactly when and where it is needed, while maintaining occupant

comfort and needs. For example, a smart water heater is able to receive a signal when there is overproduction of renewable energy and respond by adjusting its heating cycle to use that clean power and then store the hot water for use later in the day. With intelligent controls smart water heaters ensure that residents always have access to hot water, while maximizing the use of carbon-free generation by responding dynamically to grid conditions. The building efficiency sector is undergoing rapid change and is increasingly a source of innovation and new technology, with more sophisticated and cost-effective solutions for home energy management. As the sensors, controls, software, and machine learning that comprise home energy management systems advance and integrate with more technologies, these platforms can support the interconnection of solar, storage, and flexible end uses in the home to coordinate load management strategies for grid and user benefit.

Deploying these solutions in an integrated way can cost-effectively reduce peak demand, address capacity constraints, and provide other grid services—deferring transmission and distribution upgrades and reducing the need for new power plants. A recent study¹⁴ by Rocky Mountain Institute found that Clean Energy Portfolios of wind, solar, storage, energy efficiency, and demand flexibility are now cost-competitive with new natural gas plants, while providing the same grid reliability services currently serviced by natural gas.¹⁵ In order to take advantage of these clean energy resources, policy approaches must be welcoming to innovation and provide a level playing field for all combinations of technologies and distributed energy resources, like residential GEBs, to compete.¹⁶ We need to break down the silos between energy efficiency, renewables, and other distributed energy resources like electric vehicles and battery storage. New policy frameworks should welcome and enable innovative solutions and combinations of technologies that will advance decarbonization. The federal government also needs to break down the silos between agencies that work on energy issues and engage with residential buildings, to create a more cohesive government-wide strategy for decarbonization and to encourage innovative collaboration across different departments.

Advancing energy efficiency and smart energy management technologies will help homes and buildings save energy and use energy more flexibly to minimize our carbon footprint. Plans for interoperability, incentives, and maximizing data use are critical for tapping this great energy resource. When we talk about clean energy and decarbonizing the electric grid, buildings and energy efficiency must be part of that conversation. There is a growing need for policymakers to look at buildings as an integral part of the grid that not only use energy but can also generate power, store energy, and shift demand from times of high demand and cost to times when wind and solar power are abundant and energy is cheapest. With policy and program innovation that brings all of these pieces together to optimize energy usage we can reduce the need for new power plants, deliver more reliable energy services at lower costs, all while making homes healthier, more comfortable places to live.

As noted in the Residential Grid-Interactive Efficient Building Technology and Policy report, the Building Performance Association and E4TheFuture also encourage federal investment in the following areas to

¹⁴ <https://rmi.org/insight/clean-energy-portfolios-pipelines-and-plants>

¹⁵ The study also found that energy efficiency and demand flexibility—resources that GEBs can provide—are the least-cost route to meeting energy, capacity, and flexibility needs.

¹⁶ ISO New England has allowed energy efficiency to compete with traditional and renewable generation in its Forward Capacity Market for over a decade. Recent findings show the dramatic impact of energy efficiency investments on reducing the energy intensity of the regional economy. https://iso-ne.com/static-assets/documents/2019/09/a2_supplemental_information_on_changes_in_the_celt_2019_summer_demand_forecast_presentation.pptx

advance innovation with residential GEBs, supporting both decarbonization in the buildings sector and a cleaner, more resilient grid:

- **Residential GEB demonstration and deployment.** To build on research on grid-interactive efficient building solutions, funding should focus on demonstration and deployment to (1) evaluate energy optimization strategies integrating energy efficiency and smart technology in real homes and (2) assess the potential of different retrofit measures to increase energy efficiency, grid interactivity, and demand flexibility in existing homes.
- **Advance workforce education.** Curriculum development and resources to train home performance contractors on integrating smart technology within home performance retrofits to further advance residential energy efficiency and demand flexibility.
- **Research to quantify the value of residential GEBs and their benefits.** New methods and tools for valuing the hard-to-quantify benefits residential GEBs provide, including energy resiliency and non-energy benefits like convenience and safety.
- **Development and promotion of standards for interoperability.** Standard communications protocols and interoperability are key to ensuring that different technologies can work together effectively, and integrated solutions are cost-effective and future proofed.
- **Grid modernization.** Investment in full deployment of smart meters (AMI) across the entire residential sector would create an enabling infrastructure for grid-interactive energy optimization. Smart meters provide two-way communication between a home and utility and provide much more granular energy usage information, creating new opportunities for targeted energy efficiency and demand response and supporting the integration of customer-sited resources like rooftop solar and battery storage, enabling a broad range of GEB solutions.

11. What policies should Congress adopt to help communities become more resilient in response to climate change? The Select Committee welcomes all ideas on resilience and adaptation but requests comments on three specific questions:

Advancing energy efficiency in the buildings sector has the dual benefit of providing both climate change mitigation and resilience. The 2015 “Enhancing Community Resilience through Energy Efficiency” report from the American Council for an Energy-Efficient Economy (ACEEE) outlines the numerous resilience-related benefits of energy efficiency measures, including for emergency response, climate adaptation, and social and economic benefit.¹⁷

Our nation’s building stock needs to be more resilient in the face of climate change, and the increasingly frequent and devastating storms, extreme weather, and wildfires that will accompany it. Energy efficiency measures not only save energy and reduce carbon pollution, they also improve the physical structure of the building. Building envelope improvements like high-performance insulation, air sealing, and strong leak-resistant windows increase the durability of the building and its ability to withstand extreme weather and keep occupants safe. Analysts have found that homes built to be more energy efficient are more resistant to high winds, requiring fewer repairs after storms.¹⁸ Studies have also shown that buildings that are built or retrofitted to comply with the latest energy code—with efficient, well-sealed structures—are able to maintain safe indoor temperatures through extreme heat and cold and remain habitable for longer periods of time during a power outage.¹⁹ As climate change increases

¹⁷ <https://aceee.org/sites/default/files/publications/researchreports/u1508.pdf>

¹⁸ <https://www.eesi.org/articles/view/hurricanes-have-taught-americans-hard-lessons-on-resilience>

¹⁹ <http://www.aceee.org/files/proceedings/2014/data/papers/1-439.pdf>

the risk of homes being without power for prolonged periods due to severe storms as well as planned outages,²⁰ efficiency measures that improve the durability of homes and minimize residents' exposure are critical for resilience, to keep people safe through a storm or power outage.

Beyond the durability and safety of the building itself, energy efficiency improves resilience in other ways: providing health benefits like improved indoor air quality, delivering cost savings to families and businesses which creates new opportunities for productive spending and local investment, and supporting the reliability and resilience of our power grid. The health and safety and economic benefits for communities are discussed further below in #11b. In terms of benefits to the electric grid, lower energy demand through efficiency means less strain on the grid during periods of stresses. Additionally, intelligent efficiency with smart technologies and grid-interactivity enables homes to respond to grid needs and reduce or shift energy usage at key times, improving system reliability and reducing the duration and frequency of blackouts.

Congress should support robust funding for DOE programs that help communities improve energy efficiency of buildings, advance policies that remove barriers for energy efficiency retrofits (see #1), and support access to energy efficiency for low-income and vulnerable communities (described in more detail in #11b below). We recommend that the federal government also advance interagency coordination and support a government-wide strategy for carbon mitigation and adaptation in the residential sector. The Department of Energy, Environmental Protection Agency, Department of Housing and Urban Development, Department of Interior, and Federal Emergency Management Agency should be enabled to work together to combine funding and leverage more opportunities for decarbonizing homes and making them more resilient in the face of a changing climate.

b. How can Congress better identify and reduce climate risks for front-line communities, including ensuring that low and moderate-income populations and communities that suffer from racial discrimination can effectively grapple with climate change?

Energy efficiency offers a dual-pronged approach to reducing climate risks and helping front-line communities grapple with climate change: reducing vulnerability and increasing capacity to cope.²¹ Energy efficiency investments make homes healthier and more durable, while also providing important utility bill cost savings, and creating local employment opportunities. Advancing residential energy efficiency in low-income and underserved communities is an important strategy to support health, safety, and economic resilience for these communities in the face of new climate risks.

Support Access to Energy Efficiency for All Incomes

Policies aimed at retrofitting the over 115 million homes across the country will not only help reduce carbon emissions from the nation's residential building stock but will also help homeowners save money on their monthly utility bills and improve the comfort, health, safety, and resiliency of their homes.

²⁰ To prevent power lines from igniting a wildfire in dangerous high wind conditions, California utility PG&E has started the practice of preemptively shutting off its electricity grid during high-risk periods. Most recently, in October 2019 the utility cut power to customers in Northern California leaving an estimated 2.5 million people without electricity for up to a few days. As climate change increases the risk of devastating wildfires in the region the utility expects to continue these preventive power outages over the next decade as they make grid improvements to reduce future wildfire risks.

²¹ <https://aceee.org/sites/default/files/publications/researchreports/u1508.pdf>

However, upfront costs remain a significant barrier preventing low and moderate-income households from completing energy efficiency upgrades. Congress should advance policies aimed at helping middle income Americans make efficiency upgrades to their homes (e.g. HOMES Act) as well as programs designed to make efficiency upgrades to low income homes (e.g. Weatherization Assistance Program).

Addressing Energy Insecurity and Improving Health & Safety

Low-income populations and communities that suffer from racial discrimination pay a disproportionate share of their income on energy expenses—an excess energy burden which is directly related to the inefficiency of the homes they live in. According to a 2016 ACEEE study, if the low-income housing stock were brought up to the efficiency level of the average U.S. home it would lower the energy burden by 35% for low-income households, 42% for African American households, and 68% for Hispanic households.²² Improving energy affordability through efficiency measures is especially important in the face of climate change and more extreme weather conditions. In extreme temperatures, energy efficient homes are safer and more comfortable and cost less to heat and cool. This is critical, given that nearly one-third of U.S. households reported facing a challenge in paying energy bills or sustaining adequate heating and cooling in their homes in 2015, with even higher rates among low-income and racial minority households.²³ To ensure that these communities can effectively grapple with climate change, advancing energy efficiency for all will be key to addressing energy insecurity. Congress should support greater access to energy efficiency improvements and provide robust funding for low-income energy efficiency, including the Weatherization Assistance Program.

In addition to the cost-savings benefits to homeowners, efficiency upgrades also provide health and safety benefits. A DOE report on the Weatherization Assistance Program found that home improvements focused on energy efficiency can improve indoor air quality, which reduces respiratory illness and sick days, and reduce thermal stress caused by exposure to extreme indoor thermal conditions (i.e. temperature, humidity, drafts), resulting in lower medical costs and fewer deaths.²⁴ Residential energy efficiency upgrades can result in significant improvements in asthma symptoms (which affects 16% of adults in households receiving DOE funded weatherization assistance) including a 12% reduction in asthma-related emergency room visits, and help improve overall physical and mental health, according to a report from E4TheFuture that reviews existing research on the link between resident health benefits and energy efficiency upgrades.²⁵ The report also found that improvements in occupant health from residential energy efficiency are strongest among vulnerable groups: lower income households and residents with pre-existing health conditions linked to housing risks.

Reauthorize and Provide Robust Funding for Weatherization

The Weatherization Assistance Program is a cost-effective investment in communities across the country, helping vulnerable households, families, children and seniors. Research shows low-income households spend 7.2% of their income on energy, three times as much as higher income households.²⁶ The Weatherization Assistance Program helps alleviate that burden through measures like insulation

²² <http://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf>

²³ <https://www.eia.gov/todayinenergy/detail.php?id=37072>

²⁴ https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNLTM-2014_345.pdf

²⁵ <https://e4thefuture.org/wp-content/uploads/2016/11/Occupant-Health-Benefits-Residential-EE.pdf>

²⁶ <https://aceee.org/research-report/u1602>

and air sealing and other home energy efficiency upgrades that reduce energy costs. The program allows tens of thousands of Americans each year to reap the benefits of a wide range of energy-efficient technologies and practices that they would have otherwise been unable to afford.²⁷

The ***Weatherization Enhancement and Local Energy Efficiency Investment and Accountability Act (HR 2041)*** would not only ensure that this landmark program can continue to help make the homes of vulnerable Americans safer, healthier, and more energy efficient, it would also update and strengthen the program: supporting innovation in weatherization practices through a new competitive grant and modernizing the program to include the latest cost-effective technology and services—including smart home energy management systems.

We need to support low and moderate-income access to energy efficiency to ensure front-line communities have safe and healthy homes, and improved financial security through lower energy costs. In addition to helping individual households, weatherization also helps communities by spurring economic growth. Investment in weatherization creates direct jobs in sales and installation and indirect jobs in equipment manufacturing and distribution. The Weatherization Assistance Program supports thousands of local jobs across the country to do the work of in-home audits and installation of efficiency measures—jobs that cannot be outsourced.

Support Economic Growth and Access to Quality Jobs

Investment in energy efficiency creates local jobs and economic opportunity. The energy efficiency sector also has significant employment potential into the future, with job growth currently outpacing all other energy sectors and 7.8% growth projected for 2019.²⁸ Congress should help ensure that low and moderate-income populations and communities that suffer from racial discrimination have access to quality jobs in this burgeoning clean energy economy. Described in more detail in #2, the ***Blue Collar to Green Collar Jobs Development Act of 2019 (HR 1315)*** would support crucial clean energy jobs training and give priority to businesses that recruit employees from local communities and minorities, as well as women, veterans, foster children, and persons who are transitioning from fossil energy sector jobs. We encourage Congress to pass this important piece of legislation to provide resources to communities for workforce development and promote greater access to job opportunities in the growing energy efficiency industry.

Congress should advance residential efficiency and support greater access to these important measures to ensure front-line communities are able to improve the resilience of their homes, benefit from energy cost savings, and have access to quality jobs and economic opportunity into the future as we face climate change and pursue ambitious decarbonization.

Conclusion

In conclusion, E4TheFuture and the Building Performance Association believe that advancing residential energy efficiency is critical to achieving emissions reductions in line with net zero by mid-century, while also creating jobs, improving health and safety, and increasing resilience in the face of climate change. We urge Congress to address barriers to retrofitting existing homes and advance energy efficiency

²⁷ https://www.energy.gov/sites/prod/files/2018/06/f52/EERE_WAP_Fact%20Sheet-v2.pdf

²⁸ <https://e4thefuture.org/wp-content/uploads/2019/09/Energy-Efficiency-Jobs-in-America-2019.pdf>

across the entire buildings sector by supporting workforce development and training, providing incentives for homeowners, and ensuring that building efficiency is part of any conversation on clean energy and climate. We also recommend that the federal government advance interagency coordination, breaking down the barriers between different agencies that engage with the residential sector to create a broad, cohesive, and robust strategy for carbon mitigation and adaptation for homes across America. Again, thank you for providing this opportunity to submit responses to these questions. We would also appreciate the opportunity to brief you or your staff on the status of the residential energy efficiency/building performance industry and how policies can promote its further growth and bring benefits to communities across America while driving decarbonization. We look forward to working with you.

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