



July 17, 2026

Home Innovation Research Labs
Attn: John Peavey, Director of Building Science
400 Prince Georges Blvd.
Upper Marlboro, Maryland 20774
mhcc@homeinnovation.com

**RE: Department of Housing and Urban Development: Notice of Federal Advisory Committee Meeting; Manufactured Housing Consensus Committee (MHCC)
Docket No. FR-6549-N-03**

Dear Mr. Peavey,

The Manufactured Housing Institute (MHI) is pleased to provide comments to the Manufactured Housing Consensus Committee (MHCC) in advance of their meeting on July 23, 2026 to discuss recommendations to HUD regarding energy conservation standards for manufactured housing.

MHI is the only national trade association that represents every segment of the factory-built housing industry. Our members include home builders, suppliers, retail sellers, lenders, installers, community owners, community operators, and others who serve the industry, as well as 48 affiliated state organizations. Our industry is on track to build more than 100,000 homes this year, accounting for approximately 9 percent of new single-family home starts. These homes are produced by 33 U.S. corporations in 147 homebuilding facilities located across the country. MHI members represent over 90 percent of all manufactured homes constructed.

As MHI has stated in its previous comment letters dated November 23, 2021, February 28, 2022, October 12, 2022, November 11, 2022, and February 12, 2024, the United States remains in the midst of an affordable housing shortage, and manufactured housing is the nation's only form of unsubsidized affordable housing. The Department of Energy's (DOE) Energy Conservation Standards for Manufactured Housing codified at 10 C.F.R. § 460 (the Energy Rule) based on the 2021 International Energy Conservation Code (IECC), is not appropriate for use in manufactured homes. MHI has consistently explained that DOE did not meaningfully satisfy the statutory requirements to consult with HUD or implement standards that are cost effective when considering the primary purpose of manufactured housing as the only unsubsidized form of affordable housing in the United States. In its previous comment letters and during the public comments at the MHCC's 2022 and 2024 meetings, MHI identified substantial flaws in DOE's costing analysis and submitted a cost analysis of its own.

The MHCC should recommend that HUD adopt into the Manufactured Home Construction and Safety Standards (MHCSS) the energy standards recommended by the MHCC in the fall of 2022, with the enforcement of those standards through the longstanding HUD regime at 24 C.F.R. § 3282. As set forth herein, the 2022 MHCC recommendations¹ remain the most appropriate, most thoroughly vetted, and most expeditious basis for updated federal energy standards for manufactured housing. Congress has now confirmed not only that the MHCC consensus process is the exclusive path by which such standards may take effect, but also that HUD must adopt minimum standards by July 11, 2027. MHI has participated in every stage of this rulemaking process and submits these comments for the benefit of the MHCC's new and returning members alike.

¹ See Reference List: MHCC's Working Document from the October 18–20, 2022 and November 15–17, 2022 meetings, dated December 2, 2022.

HUD itself has framed the July 23 meeting as part of its effort to refine proposed updates to the MHCSS and the supporting technical analysis, including anticipated costs and benefits. The purpose of this meeting is therefore not to decide whether the process should begin. It has begun. The MHCC should use the meeting to provide HUD with a concrete recommendation that will allow the Department to satisfy the mandate Congress has now imposed.

1. Congress Has Directed HUD to Adopt Energy Standards Within One Year Through the MHCC Process.

On June 22 and 23, 2026, the Senate and House of Representatives passed the 21st Century ROAD to Housing Act by overwhelming bipartisan margins, and the Act became law on July 11, 2026 as Public Law 119-101. Congress did more than clarify which agency controls federal manufactured housing energy standards. The Act provides that no federal energy efficiency standard for manufactured homes may have legal effect unless and until HUD adopts it through the MHCC consensus process. It also directs HUD to adopt minimum energy-efficiency standards not later than one year after enactment and to update those standards at least once every three years. HUD must therefore adopt the initial standards by July 11, 2027.

Congress has therefore resolved the jurisdictional conflict and imposed an affirmative duty on HUD. The MHCC has previously advised that HUD, not DOE, is the appropriate body to administer and enforce energy standards for manufactured housing. In 2022, the MHCC concluded that DOE circumvented the standards development process prescribed in EISA, which requires cost justification and consultation with HUD. Going forward, federal energy standards for manufactured housing will become effective only through HUD's rulemaking process, including consultation with the MHCC under 42 U.S.C. § 5403.

The intervening history confirms the wisdom of Congress's approach. In the four years since DOE issued its May 2022 final rule, no manufactured home has been required to comply with it. Instead, the rule has produced litigation, repeated compliance-date delays, and unresolved enforcement questions. DOE's December 2023 enforcement proposal lacked testing, inspection, certification, and safe-harbor requirements and would have relied on HUD records not designed to establish compliance, backed by penalties tied to a term with no industry meaning. By September 2025, DOE itself was reconsidering the standards. Four years of the DOE process produced only uncertainty, while two MHCC deliberation cycles produced a complete, cost-justified, consensus recommendation supported by a substantial technical and economic record and ready for action.

2. Adoption of the 2022 Recommendations Implements Both the New Statute and Executive Order.

Executive Order 14394, "Removing Regulatory Barriers to Affordable Home Construction" (March 13, 2026), does not create a no-standards option for manufactured housing. The Executive Order directs HUD and DOE, "within their respective authorities," to reform or, where appropriate, eliminate housing-related energy-efficiency requirements that are unduly burdensome or costly, "to the maximum extent practicable and consistent with applicable law." It specifically identifies DOE's Energy Conservation Standards for Manufactured Housing as a subject of that review. At the same time, Section 6(a) makes clear that the Executive Order does not limit authority granted by Congress, and Section 6(b) requires that the order be implemented consistent with applicable law.

Applicable law now requires HUD to adopt minimum energy-efficiency standards by July 11, 2027. The Executive Order therefore informs what those standards should look like, not whether HUD may decline to act. Congress has answered that question. The issue before the MHCC is which standards HUD should adopt and whether those standards are supported by an adequate record.

The 2022 MHCC recommendations provide the appropriate answer. They would replace the DOE standards singled out for review with incremental, cost-justified requirements developed specifically for manufactured housing through the statutory consensus process. The record before the MHCC demonstrates that the recommendations improve energy performance while avoiding the excessive first costs, construction limitations, and enforcement problems associated with DOE's rule. Adoption of the 2022 recommendations therefore does not conflict with the Executive Order. It carries out the type of regulatory reform the Executive Order directs.

Adoption of the recommendations would also advance the Executive Order's broader goal of reducing barriers to affordable housing. A single, modern, and cost-justified federal standard, enforced through the HUD label and protected by federal preemption under 42 U.S.C. § 5403(d), would prevent disparate state and local requirements from affecting the same aspects of manufactured-home performance. It would also resolve the continued uncertainty created by the DOE standards, which remain codified even though they cannot have legal effect unless adopted by HUD. For this industry, regulatory certainty through one uniform national standard reduces regulatory burden and protects affordability.

The MHCC has already charted this course. At its January 27–28, 2026 meeting, the Committee rejected the DOE standards and identified the most constructive path forward as the development of energy-efficiency improvements specifically designed for manufactured housing—improvements that account for factory-built construction, preserve affordability, and maintain reasonable consumer choice. The December 2, 2022 Working Document is precisely that product. It was developed through the MHCC process and reflects the same approach the Committee endorsed in January. Nothing in the Executive Order requires a different result; the 2022 recommendations were specifically designed to avoid unduly burdensome and costly requirements.

3. The Industry Supports Updated Energy Standards and Is Already Building to Them.

MHI does not oppose increased standards for energy efficiency in manufactured homes. MHI supports energy conservation efforts, and our manufacturer members are leading the way in energy-efficient manufacturing by designing and building homes that save energy and save homebuyers energy costs. The industry's concern with the DOE's Energy Rule was never opposition to energy efficiency; it was opposition to a rule that applied site-built assumptions to a national, performance-based code without consultation with HUD, without proper consideration of cost, and without any consideration of testing and certification.

Moreover, one of the persistent challenges facing manufactured housing and one reason the industry continues to face unwarranted stigma, is the perception that manufactured homes are built to an outdated code whose energy provisions have not been meaningfully updated in decades. Today's manufactured homes are built with advanced, factory-controlled processes, and most of the industry is already building the most energy efficient options provided to consumers. Adoption of the 2022 MHCC recommendations would bring the written standards into alignment with actual industry practice, modernize the program, and remove unnecessary criticism.

4. Cost-Benefit Analysis Demonstrates DOE's Rule Harms Consumers.

In November 2022, on behalf of MHI, the Analysis Group prepared an independent assessment of DOE's cost-benefit analysis for use in the MHCC's deliberations. That assessment concluded that, when real-world economic conditions are accounted for, DOE's Energy Rule imposes a net cost, not a net benefit, on the vast majority of manufactured housing consumers.

The Analysis Group found that DOE's own model shows a net cost for approximately 95% of Tier 2 shipments. When DOE's cost-benefit model is updated to reflect actual post-2022 inflation and interest rate increases, the 10-year life-cycle cost ("LCC") of compliance under Tier 2 reflects a net cost rather than a savings for approximately 95% of Tier 2 shipments nationwide. DOE's original claim that the rule produces net consumer savings is not supported under current economic conditions.

Additionally, the DOE ignored significant compliance costs. DOE's model failed to account for substantial real-world compliance costs, including duct and air-leakage testing costs of approximately \$1,000 per home, which alone could nearly eliminate any claimed life-cycle savings across all tiers and time periods. Additionally, DOE's model failed to consider the additional transportation costs of approximately \$400–\$500 per multi-section home due to increased insulation weight, and persistent insulation supply-chain constraints.

The DOE Energy Rule disproportionately harms low-income and minority buyers. Manufactured housing serves as a critical path to homeownership for low-income and minority households, and these buyers disproportionately rely on higher-cost personal property loans (chattel financing) rather than conventional mortgages. For example, Black or African American households finance manufactured home purchases via personal property loans at a rate 22.3 percentage points higher than the overall household average, and because these consumers face higher interest rates and lower credit scores, the increased home costs imposed by DOE's rule compound into even greater negative life-cycle impacts for this population.

5. The 2022 MHCC Recommendations Are Cost-Justified, Consensus-Based, and Technically Sound.

The MHCC's 2022 recommendations, not DOE's Energy Rule, provide the appropriate cost-effective standards Congress has now directed HUD to adopt. After a section-by-section review of DOE's rule during its October and November 2022 meetings, the MHCC retained workable provisions, revised those that were not, and documented the basis for each change. The resulting December 2, 2022 Working Document would improve energy efficiency by approximately 22 percent on average while preserving affordability, consumer choice, and practical constructability.

Several points are key. First, the recommendations provide meaningful but achievable improvements to thermal envelope requirements, air sealing, duct leakage, ventilation, controls, and hot water provisions using available materials and standard 2x4 wall construction in all climate zones. This avoids the framing changes, shipping-height issues, egress and ventilation conflicts, and design limitations that DOE's rule would impose, particularly for Tier 2 homes in Climate Zone 3.

Second, the recommendations reflect the MHCC's statutory obligation to consider cost and affordability. By contrast, the analyses presented to the MHCC showed that, when actual construction-cost inflation and interest rates were considered, DOE's rule produced a negative ten-year life-cycle cost for approximately 95% of Tier 2 shipments, with the average Tier 2 purchaser needing approximately 12.6 years to recover the increased purchase price through energy savings. DOE's own sensitivity analysis acknowledged that more than 5,000 families per year could be priced out of manufactured housing, with industry data suggesting the actual impact could be higher.

Third, the MHCC recommendations fit within HUD's existing enforcement framework, including DAPIA design approval, IPIA in-plant inspection, HUD certification labels, and a practical monthly witnessed duct-leakage testing protocol. That approach gives manufacturers objective compliance certainty and consumers quality assurance, while avoiding costly site-by-site field testing that could eliminate projected energy savings.

Finally, the recommendations reflect sound technical judgment and consensus legitimacy. The MHCC rejected DOE’s retail-price-based tier structure as unworkable and inequitable, instead recommending uniform climate-zone-based standards by construction type. Two differently constituted Committees reached the same core conclusion: manufactured housing energy standards should be updated, but incrementally and through HUD’s proven framework.

4. Summary of the 2022 MHCC Recommendations.

For the convenience of members who have joined the MHCC since 2022, the table below summarizes the principal recommendations contained in the December 2, 2022 Working Document. The Working Document, and the principal supporting minutes and economic analysis are linked in the References and attached as Exhibit A.

Area of the MHCSS	MHCC's 2022 Recommendation
Climate zones (§ 3280.506)	Replaces the outdated “Uo Value Zone” terminology with three modern Climate Zones, with a state-by-state table for clarity, aligning the MHCSS's structure with contemporary energy codes.
Thermal envelope – performance path (§ 3280.506)	Establishes updated maximum Uo values in two tiers (Tier 1 single-section; Tier 2 multi-section) — a meaningful improvement over the existing standard (e.g., Zone 1 improves from 0.116 to 0.110 for Tier 1 and 0.090 for Tier 2), while remaining achievable with standard construction.
Thermal envelope – prescriptive path (§ 3280.507)	Sets minimum insulation R-values, window/skylight/door U-factors, and SHGC limits by climate zone and tier, calibrated so homes can continue to be built with 2x4 walls in all climate zones — preserving consumer options (cathedral ceilings, natural lighting), material availability, and standard transportation heights. U-factor alternatives to R-values are provided for design flexibility.
Air sealing and air barriers (§§ 3280.502, .503, .505)	Adopts modern air-barrier definitions and component-by-component installation criteria (ceilings, ducts, floors, mating lines, recessed lighting, rim joists, windows and doors), with sealing requirements adapted to factory construction.
Duct leakage testing (§ 3280.715)	Sets duct air-leakage limits of 4 cfm/100 sq. ft. (ducts outside the thermal envelope) and 8 cfm/100 sq. ft. (ducts entirely inside the envelope), verified through at least one IPIA-witnessed factory test per month — a practical, in-plant protocol in lieu of impractical site-by-site field testing.
Mechanical ventilation (§ 3280.103)	Adds minimum fan-efficacy requirements for whole-house mechanical ventilation systems.
Thermostats and controls (§ 3280.704)	Adds requirements for thermostat placement and programmable-thermostat capability, with recommended set points communicated through the homeowner's manual.
Hot water systems (§ 3280.609)	Adds requirements for heated-water circulation systems (when installed) and R-3 insulation for hot water piping outside conditioned space.

Cooling equipment (§ 3280.714)	Updates efficiency terminology to SEER2, consistent with current federal test procedures.
Equipment sizing (§ 3280.716)	Declines to adopt ACCA Manual J/S site-specific sizing calculations, which cannot be applied to homes built to a national, performance-based code without a known installation site; retains the MHCSS's existing, adequate sizing methodology.

6. Adoption of the 2022 Recommendations Is the Most Expeditious Path to Effective, Enforceable Standards.

MHI recognizes that some members may ask whether the MHCC should reopen these issues and develop entirely new recommendations. MHI respectfully urges the MHCC not to take that path. The 2022 recommendations remain technically current. They were built upon the structure of the Energy Rule and the provisions of the 2021 International Energy Conservation Code underlying it, adapted to the design, construction, and transportation realities of manufactured housing. Nothing in the intervening period has undermined their technical foundation; to the contrary, the industry's continued progress has confirmed their achievability.

Congress has already supplied the mechanism for addressing later technical developments. HUD must update the standards at least once every three years. The possibility that provision from the 2024 IECC or later model codes may warrant future considerations is therefore not a reason to delay the initial standards. HUD should adopt the record-ready 2022 recommendations now and address later developments through recurring review process Congress has required.

Without adoption of updated energy standards, it would leave the HUD Code's energy provisions outdated, prolong the uncertainty created by DOE standards that remain codified but cannot have legal effect unless adopted by HUD, and compress time available for public comment, final action, and an orderly transition before July 11, 2027. It would also leave manufacturers and consumers more exposed to disparate state and local requirements addressing the same aspects of manufactured home performance. Congress preserved the broad scope of federal preemption under 42 U.S.C. § 5403(d), confirming the value of one comprehensive national standards administered through HUD's existing program.

The 2022 recommendations are drafted in regulatory text, annotated, and supported by a complete administrative record. HUD can advance them directly into notice-and-comment rulemaking under 42 U.S.C. § 5403. Beginning anew would add years to the process, jeopardize HUD's ability to satisfy the new statutory deadline, and provide no corresponding benefit to consumers or energy efficiency.

The industry is prepared to implement these standards. Manufacturers have planned for these levels, supply chains have adjusted, and most production already meets or exceeds them. Nor is this request new. MHI made the same recommendation to the MHCC in its February 12, 2024 comment letter, that the MHCC request that HUD adopt into the MHCSS the standards recommended by the MHCC in the fall of 2022, with enforcement through the longstanding HUD regime at 24 C.F.R. § 3282. Congress's action has now removed the principal jurisdictional obstacle, confirmed HUD's authority, and imposed a deadline for action.

7. Conclusion

For the foregoing reasons, MHI respectfully requests that the Manufactured Housing Consensus Committee vote to formally re-adopt and reaffirm the MHCC's 2022 Working Document recommendations at or following the July 23, 2026 meeting, transmit those recommendations to the HUD Secretary with a request that HUD promptly initiate notice-and-comment rulemaking to incorporate the recommended modifications into the MHCSS, and decline to reopen or re-litigate the technical analysis underlying the 2022 recommendations, which were the product of thorough deliberation and overwhelming consensus.

Congress has determined that HUD must adopt minimum energy-efficiency standards and periodically update them. Executive Order 14394 requires those standards to be practical, affordable, and no more burdensome than necessary. The 2022 MHCC recommendations satisfy both directives and provide the only fully developed, consensus-based path capable of meeting Congress's deadline without sacrificing affordability or consumer choice. The time for further jurisdictional debate has passed. HUD and the MHCC should now complete the work Congress has directed them to perform. MHI stands ready to provide any additional information, technical support, or testimony the Committee may require. We appreciate the Committee's service and look forward to working together to advance affordable, energy-efficient manufactured housing for all Americans. In support of these comments, MHI shares the references and exhibit identified at the end of this letter, which document the technical, procedural, and economic record underlying the MHCC's 2022 recommendations.

We appreciate the opportunity to submit these comments and stand ready to assist HUD and the MHCC as this important work moves forward.

Sincerely,

Lesli Gooch, Ph.D.
Chief Executive Officer

Exhibit

Exhibit A - Analysis Group's Analysis of DOE's Energy Conservation Standards for Manufactured Housing, dated November 11, 2022.

References

[MHCC's Working Document from the October 18–20, 2022 and November 15–17, 2022 meetings, dated December 2, 2022.](#)

[October and November 2022 MHCC Minutes.](#)

[MHI's Previous Letter from October 12, 2022.](#)

[MHI's Previous Letter from November 11, 2022.](#)

[MHI's Previous Letter from February 12, 2024.](#)

Exhibit A

Analysis Group's Analysis of DOE's Energy Conservation Standards for Manufactured Housing, dated November 11, 2022

Analysis of DOE's Energy Conservation Standards for Manufactured Housing

Identification of Potential Issues and Sensitivity Analyses

November 11, 2022

Executive Summary

■ Assignment

- DOE relied upon a cost-benefit analysis for consumers of manufactured homes
- Analysis Group assessed this cost-benefit analysis with particular focus on **important inputs that have changed** since DOE's original analysis

■ Summary of Preliminary Conclusions

1. Adjusting DOE's assumptions for recent inflation and interest rate increases invalidates DOE's conclusion that its proposed rule is cost-effective for consumers
2. DOE's rule will have particularly negative impacts on minority and low-income homebuyers, who tend to face higher borrowing costs
3. DOE has underestimated the number of households that will no longer be able to afford a manufactured home as a result of the rule
4. DOE has failed to consider additional costs of compliance, such as duct testing and transportation costs, which could further negate any anticipated savings for consumers

Qualifications

Pavel Darling, Vice President *(MBA, MIT Sloan School of Management; B.A. in Economics, Middlebury College)*

Mr. Darling is an expert on energy matters, and often consults to utilities, state and regional organizations, and global companies in his work. He focuses on projects related to cost/benefit analyses of new construction and resource retirements; environmental effects of emissions and pollution controls; economic impacts of energy projects, mergers and policies; and natural gas, biomass, and other market studies. Mr. Darling also has extensive experience working on various climate change projects, including assessments of decarbonization policy proposals and quantification of greenhouse gas emissions impacts.

He has also submitted and supported expert testimony across different venues, including state utility commissions, siting boards, the Federal Energy Regulatory Commission and the Environmental Protection Agency. Mr. Darling's prior experience working at a utility involved preparing annual filings and working with stakeholders to assess bill impacts of proposed energy efficiency changes. He has also coauthored a number of published reports and journal articles.

About Analysis Group

Analysis Group is one of the largest international economics consulting firms, with more than 1,000 professionals across 14 offices in North America, Europe, and Asia. Since 1981, we have provided expertise in economics, finance, health care analytics, and strategy to top law firms, Fortune Global 500 companies, and government agencies worldwide. Our internal experts, together with our network of affiliated experts from academia, industry, and government, offer our clients exceptional breadth and depth of expertise.

Analysis Group's Energy & Environment practice is distinguished by our deep expertise in economics, finance, regulatory issues, and public policy, as well as significant experience in environmental economics and energy infrastructure development. We have worked on energy issues for a wide variety of clients, including energy producers, energy customers, regulatory commissions and government agencies, system operators, foundations, and nongovernmental institutions.

Background on DOE's Energy Efficiency Standards for Manufactured Housing

- Key Dates:

- Aug. 26, 2021 DOE issued Supplemental Notice of Proposed Rulemaking (SNOPR)
- May 31, 2022 Final rule and cost-benefit analyses released, relying on data from 2021 and earlier
- May 31, 2023 Expected compliance date

- By statute, DOE must consider cost effectiveness (42 U.S.C 17071(b)(1))

- "The energy conservation standards established under this section shall be based on the most recent version of the International Energy Conservation Code (including supplements), **except in cases in which the Secretary finds that the code is not cost-effective**, or a more stringent standard would be more cost-effective, based on the impact of the code on the purchase price of manufactured housing and on total life-cycle construction and operating costs."

Summary of Preliminary Conclusions

DOE's conclusions on cost effectiveness disregard or do not sufficiently consider variation in key cost inputs over time and across groups for buyers and suppliers

1 **Inflation and Cost Increases**

DOE has failed to consider the impacts of considerable cost increases and supply chain constraints. Taking these into account, DOE's conclusion is invalid and the rule has a net cost to consumers rather than a benefit.

2 **Negative and Inequitable Impacts**

DOE has failed to consider negative impacts on low-income and minority homebuyers.

3 **Affordability and Credit Access**

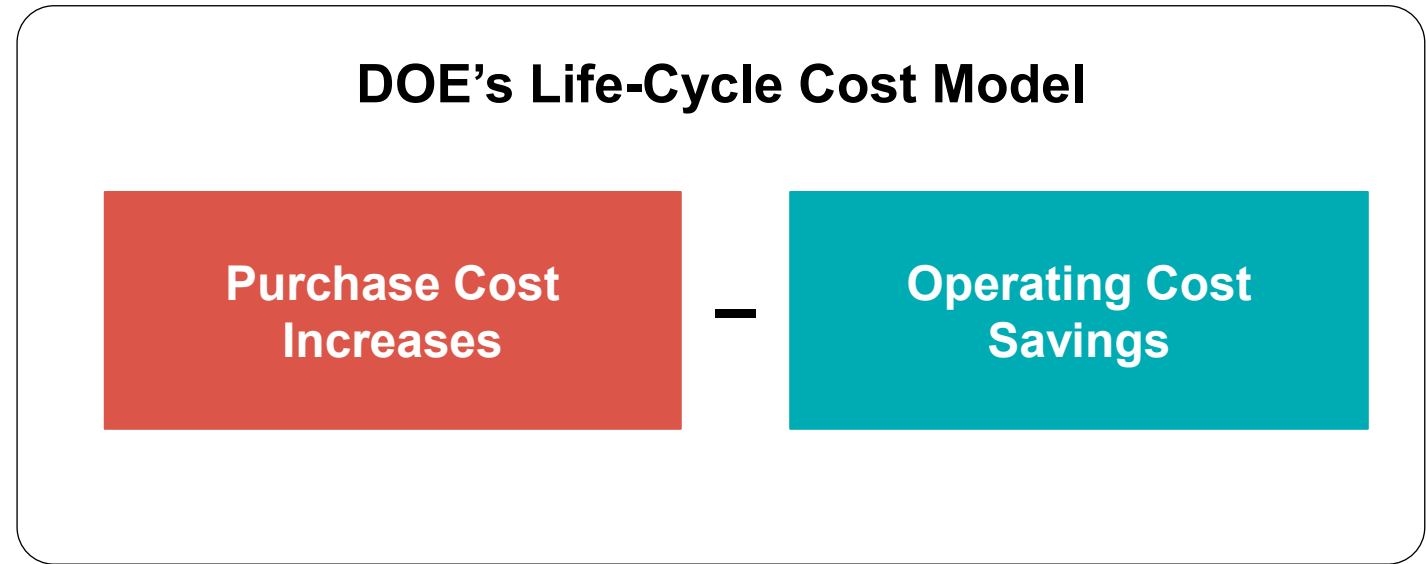
DOE has underestimated potential impacts on credit access and lost sales.

4 **Additional Costs**

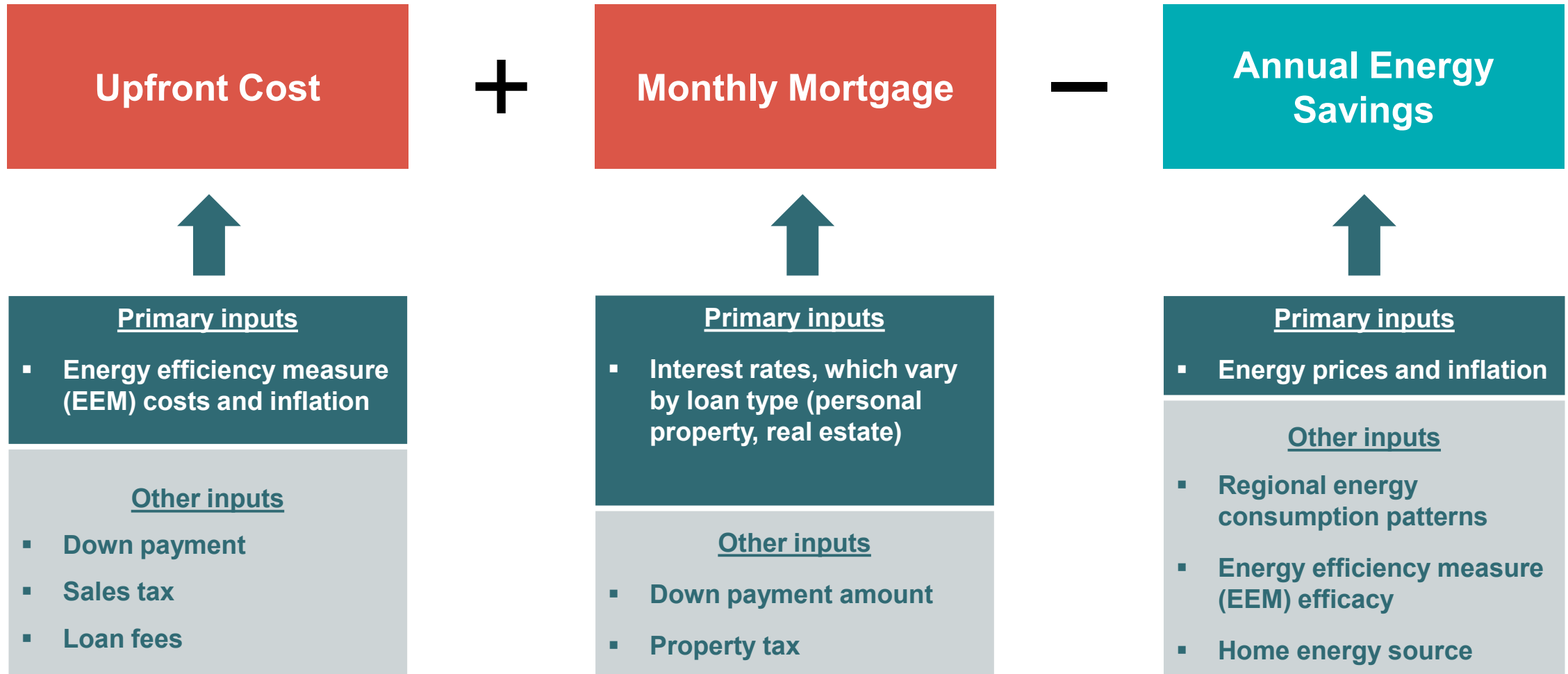
DOE has failed to consider potential costs of testing and compliance, transportation, and supply chain constraints.

Background: DOE's Life-Cycle Cost (LCC) Model

- DOE estimated the **total customer cost** over the life of the manufactured home via the Life-Cycle Cost model, including:
 - **Purchase costs** (e.g., the price of additional energy efficiency measures), and
 - **Operating costs** (e.g., energy bill savings)
- Future costs and savings are discounted to their value in the present year
- Analysis occurs over both 10- and 30-year periods
- DOE also calculates a payback period, equal to the increase in upfront cost divided by the energy savings in first year



Our Focus: Evaluating DOE's Cost-Benefit Analysis by Updating Key Inputs



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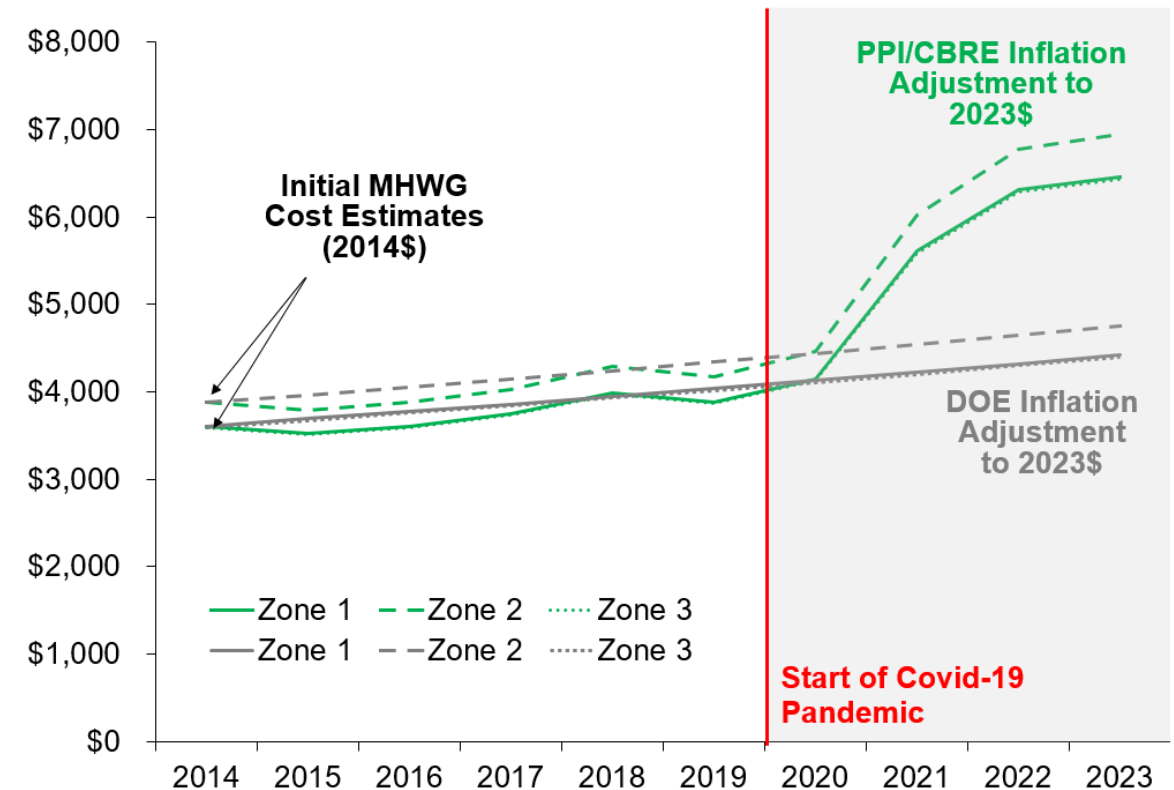
4 Additional Costs

DOE has failed to consider potential costs of testing and compliance, transportation, and supply chain constraints.

DOE Has Inadequately Adjusted EEM Cost Estimates for Inflation

- DOE calculated the costs of energy efficiency measures using cost estimates provided by the Manufactured Housing Working Group in **2014**
- To adjust for inflation, DOE assumes an annual nominal cost increase of **2.3 percent** between 2014-2023 (See gray lines)
- However, costs have increased substantially since the start of the Covid-19 pandemic. According to the BLS Producer Price Index for construction costs, materials costs have grown at an average annual rate of **6.5 percent** between 2014-2021, driven mostly by cost increases of **35.1 percent** from 2020-2021 (See green lines)
- Industry interviews suggest even higher recent increases beyond PPI, with costs at a new floor and unlikely to regress

Estimated Costs of Energy Efficiency Measures, by Inflation Adjustment Approach and Climate Zone



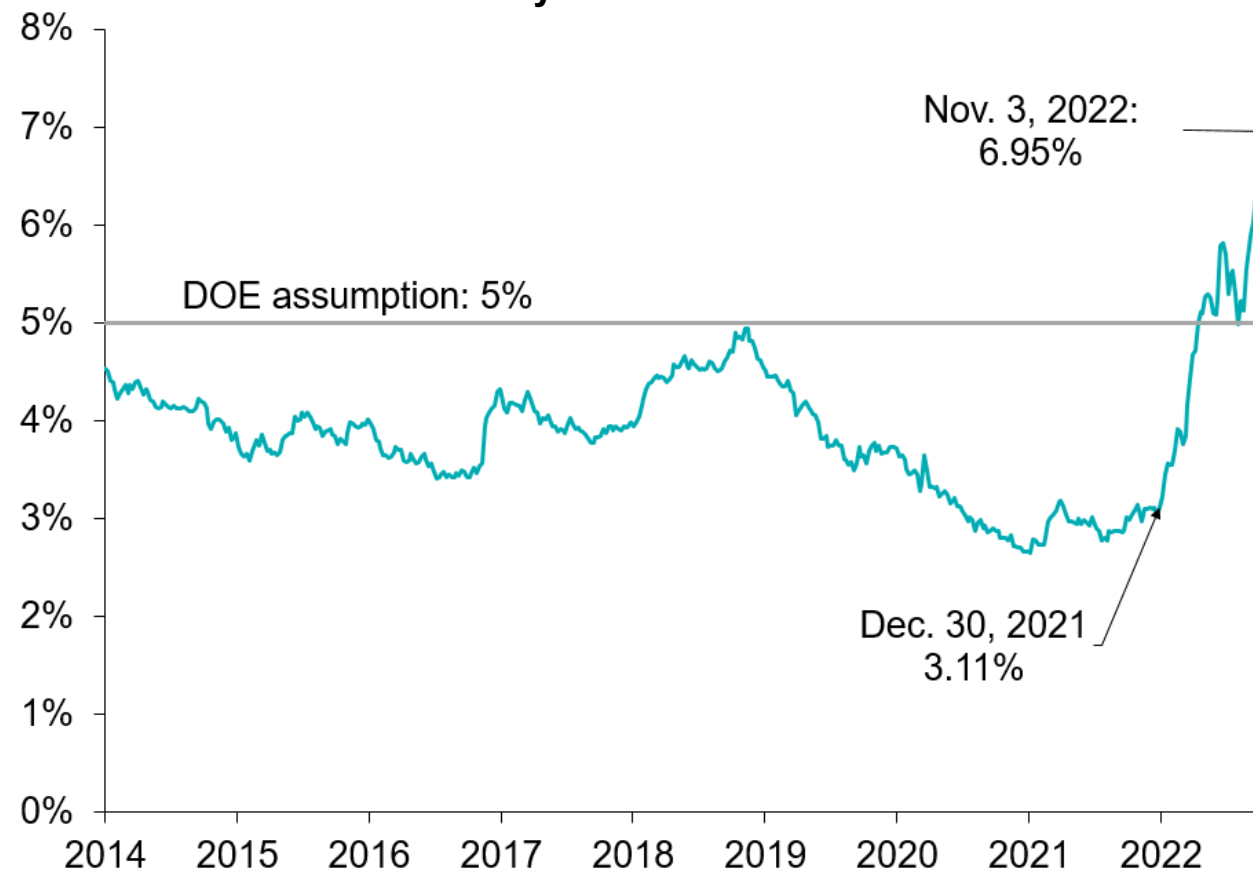
Note: Inflation estimates for PPI/CBRE series for 2022 and 2023 are from the "decreased demand" scenario of the CBRE's Construction Costs Index Forecast.

Sources: U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Special Indexes: Construction Materials [WPUSI012011], retrieved from FRED on October 30, 2022, Federal Reserve Bank of St. Louis, available at <https://fred.stlouisfed.org/series/WPUSI012011>; CBRE Research, "2022 U.S. Construction Cost Trends," July 2022, available at <https://www.cbre.com/insights/books/2022-us-construction-cost-trends>; U.S. Department of Energy, Manufactured Housing Life-Cycle Cost Analysis (LCC) Spreadsheet, May 18, 2022, available at <https://www.regulations.gov/document/EERE-2009-BT-BC-0021-1996>.

Mortgage Interest Rates Have Increased Above DOE's Assumptions

- DOE assumed interest rates of **5 percent** for mortgage loans and **9 percent** for personal property loans
- These assumptions were arguably conservative at the time, but mortgage rates have increased from approximately 3 to **7 percent**
- Industry interviews have suggested that personal property loan interest rates may be as high as **11.5 percent** for some borrowers
 - Moreover, DOE's own review of available evidence suggests that personal property loan interest rates are typically between 0.5 percentage points and 5 percentage points higher than real estate loan interest rates

**30-Year Fixed Rate Mortgage Average in the United States
January 2014 – November 2022**



Sources: Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States [MORTGAGE30US], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/MORTGAGE30US>, November 3, 2022; U.S. Department of Energy, "2022-05 Technical Support Document: Final Rule Energy Conservation Standards for Manufactured Housing, May 18, 2022, available at <https://www.regulations.gov/document/EERE-2009-BT-BC-0021-1999>, p. 8-4.

Energy Costs Have Increased As Well, Increasing Anticipated Savings

- Over the past year, energy costs have increased due to geopolitical and pandemic related disruptions
- The U.S. Energy Information Administration has increased its forecasted energy prices for 2023 and beyond based on its *Annual Energy Outlook* (AEO)
- The DOE LCC analysis relies on energy price forecasts from 2021

U.S. Energy Information Administration's Forecasted Energy Prices, by Forecast Year

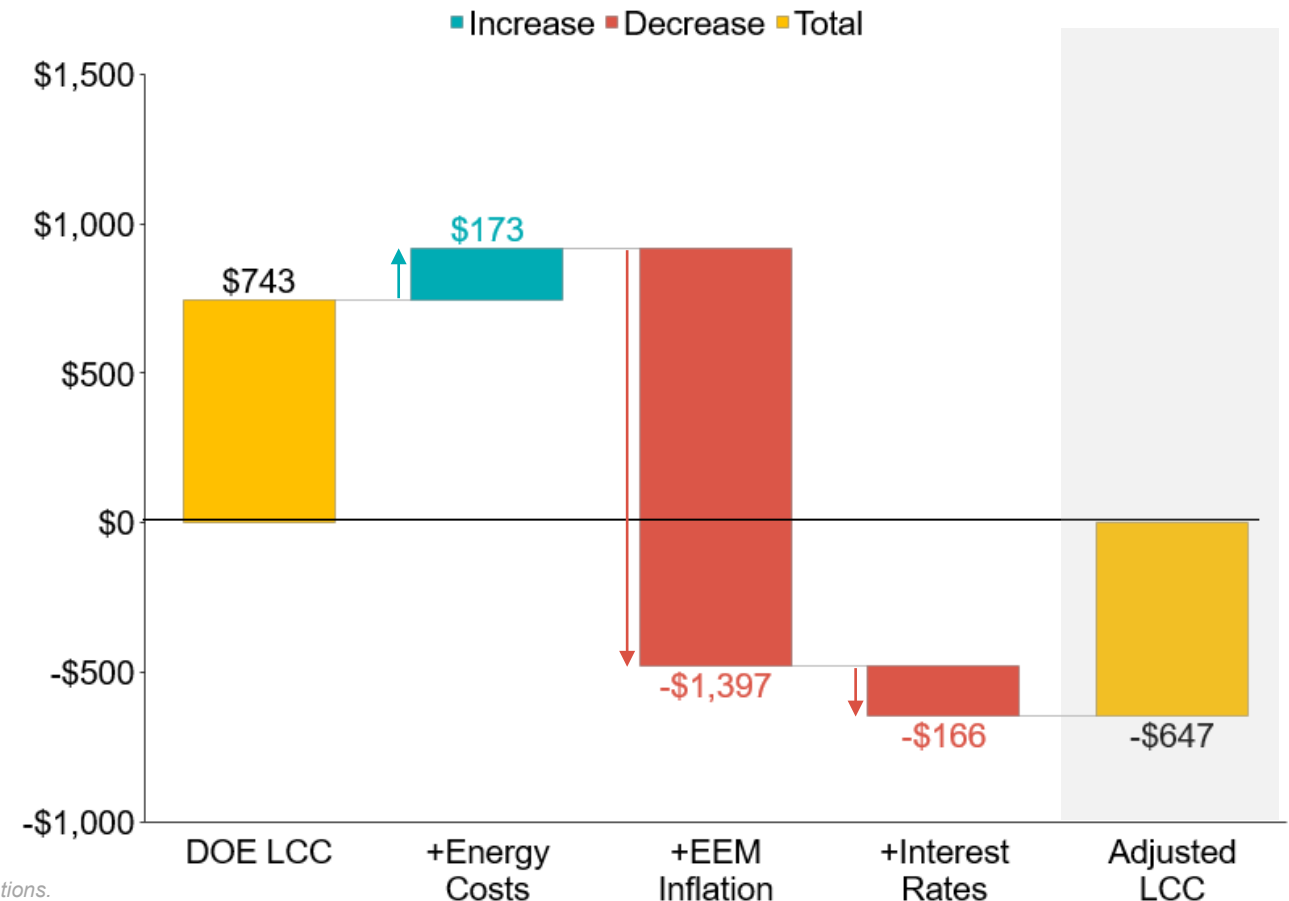
	Nominal Energy Prices			
	AEO 2021	AEO 2022	Units	% Change
	Assumptions	Assumptions		
Natural Gas	\$10.14	\$11.70	\$/Mbtu	+7.1%
Propane	\$17.30	\$21.49	\$/Mbtu	+10.8%
Elec Heat	\$0.13	\$0.14	\$/kWh	+1.9%
Elec Cool	\$0.13	\$0.14	\$/kWh	+1.5%
Elec Other	\$0.13	\$0.14	\$/kWh	+1.9%
Oil	\$17.75	\$21.71	\$/Mbtu	+10.0%

Sources: Annual Energy Outlook 2022, Table: Table 3. Energy Prices by Sector and Source, retrieved from U.S. Energy Information ; Short-Term Energy Outlook Data Browser, 2. Energy Prices, retrieved from U.S. Energy Information Administration on November 03, 2022, available at <https://www.eia.gov/outlooks/steo/data/browser/#/?v=8>.

On Net, Changes in the Recent Economic Environment Have Reversed Expected Cost Savings from the DOE Rule

- While increased energy cost forecasts have increased expected savings from the rule, the large increase in construction material costs since 2022 far outweighs these gains
- Additionally, adjusting for higher interest rates adds to expected increased costs
 - Real estate loan interest rates have been adjusted from 5 percent to **7 percent**
 - Personal property loan interest rates have conservatively been left at DOE's assumption of **9 percent**

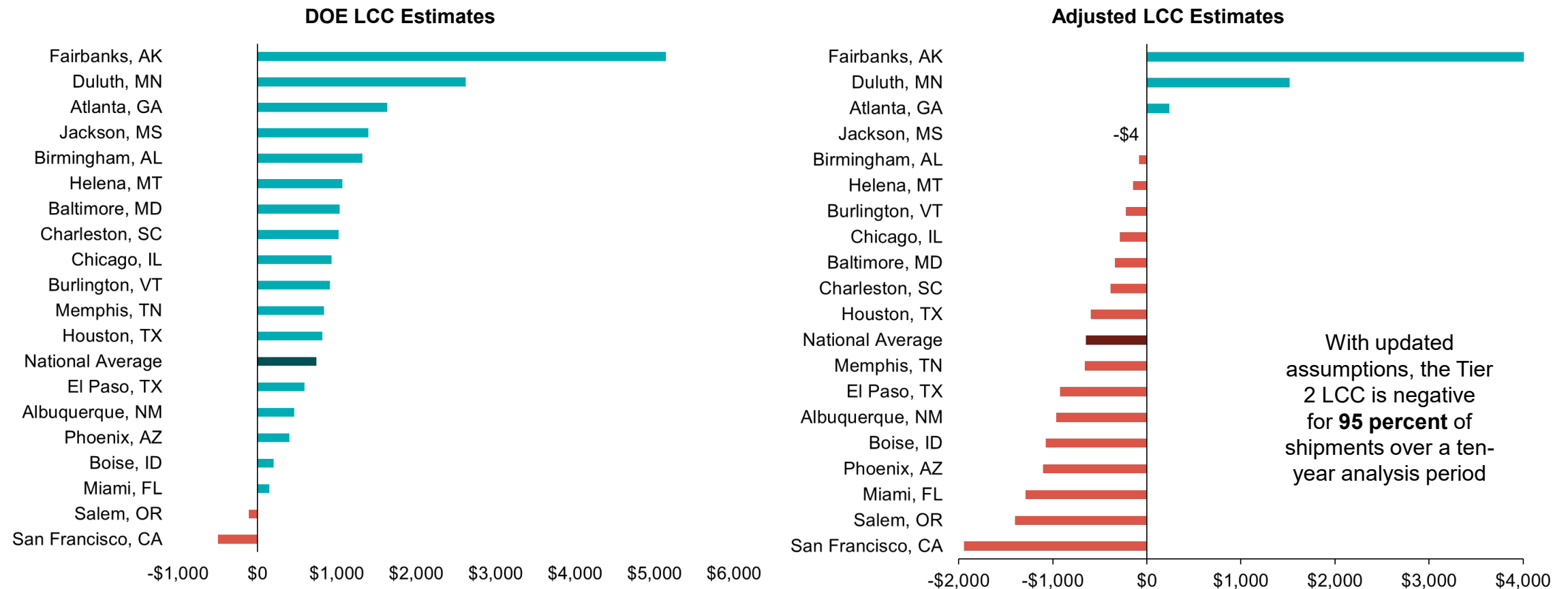
Tier 2 LCC Adjustments - 10-Year Analysis Period



Sources: U.S. Bureau of Labor Statistics, CBRE Research, Department of Energy, Freddie Mac, AG Calculations.

With Updated Costs, 10-Year Tier 2 LCC Negative For Most of the Country

Tier 2 LCC Adjustments, by City (10-Year Analysis Period)



Sources: U.S. Bureau of Labor Statistics, CBRE Research, Department of Energy, Freddie Mac, AG Calculations.

Summary of Preliminary Conclusions

DOE's conclusions on cost effectiveness disregard or do not sufficiently consider variation in key cost inputs over time and across groups for buyers and suppliers

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2 Negative and Inequitable Impacts

DOE has failed to consider negative impacts on low-income and minority homebuyers.

3 Affordability and Credit Access

DOE has underestimated potential impacts on credit access and lost sales.

4 Additional Costs

DOE has failed to consider potential costs of testing and compliance, transportation, and supply chain constraints.

DOE's Average Buyer Analysis Masks Negative Outcomes for a Number of Subgroups

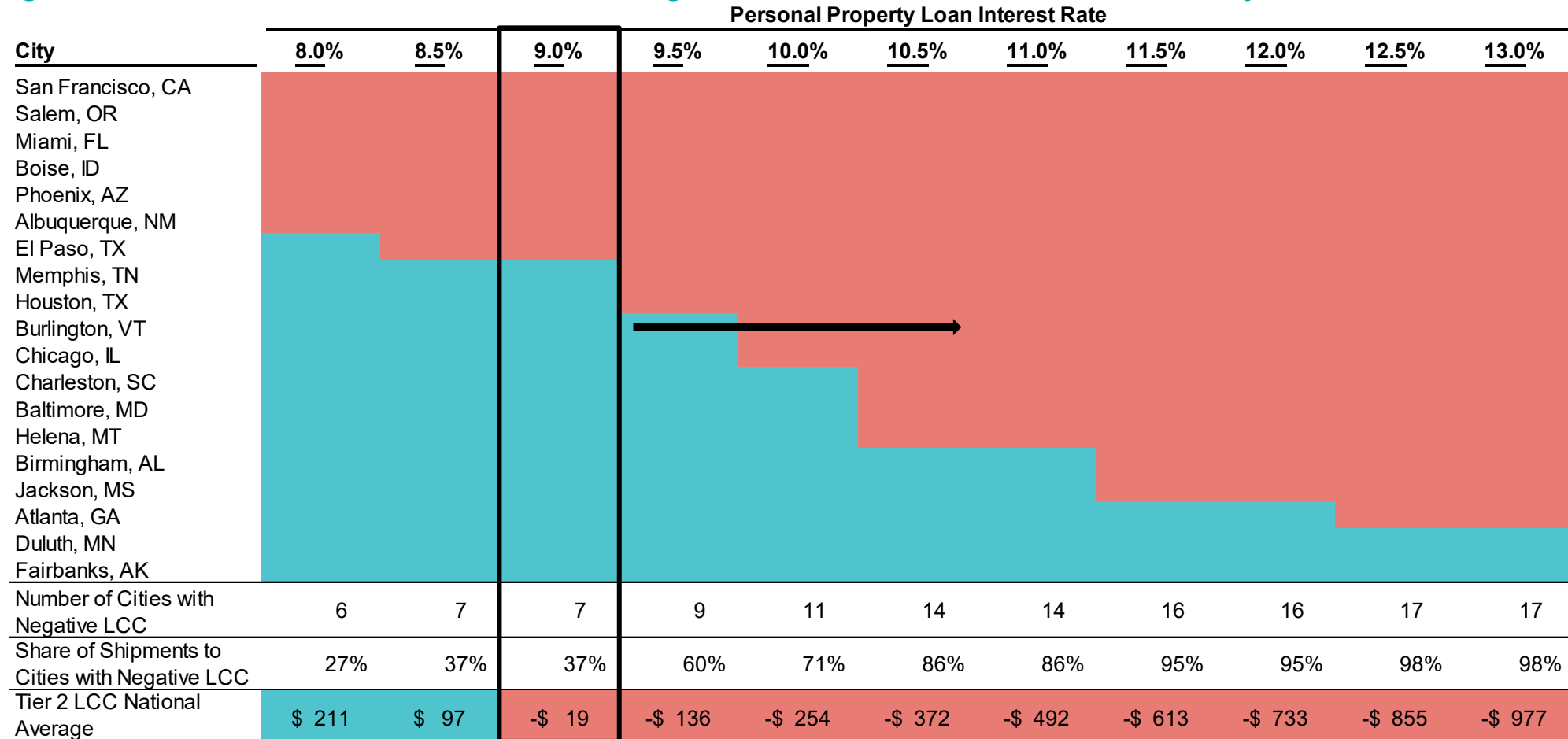
- DOE LCC calculation is an average of the LCCs for many types of buyers
- LCC estimates vary along many dimensions, including:
 - Loan type (personal property, real estate, cash)
 - Credit score
 - Home heating fuel type (e.g., natural gas, electric resistance, heat pump)
 - Climate zone/geography
- Ultimately, low-income and minority buyers are more likely to be negatively impacted by the rule
 - The Biden Administration has prioritized housing affordability and racial equity:

“The Federal Government has a critical role to play in overcoming and redressing... [its role in declining to invest in communities of color and in failing to provide equitable access,] and in protecting against other forms of discrimination by applying and enforcing Federal civil rights and fair housing laws. It can help ensure that fair and equal access to housing opportunity exists for all throughout the United States.”

Source: “Memorandum on Redressing Our Nation’s and the Federal Government’s History of Discriminatory Housing Practices and Policies,” *The White House*, January 26, 2021, available at <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/26/memorandum-on-redressing-our-nations-and-the-federal-governments-history-of-discriminatory-housing-practices-and-policies/>.

Under DOE's Original Assumptions, 10-Year LCC for Tier 2 Personal Property Loans is Negative

With Higher Interest Rates, LCC Becomes Negative for More Parts of the Country



Note: Red indicates negative LCCs and blue indicates positive LCCs. Darker colors correspond with higher absolute values. **Source:** DOE LCC Model.

Minority Buyers Are Relatively More Likely to Rely on Higher-Cost Personal Property Loans to Finance Purchases

- Many borrowers such as those with low credit scores or residents of Manufactured Housing communities face interest rates as high as 11.5 percent
- Minority buyers finance MH purchases with personal property loans at especially high rates compared to non-minority buyers

Share of Manufactured Home Purchases Financed by Personal Property Loans (vs. Real Estate Only), by Demographic Cohort

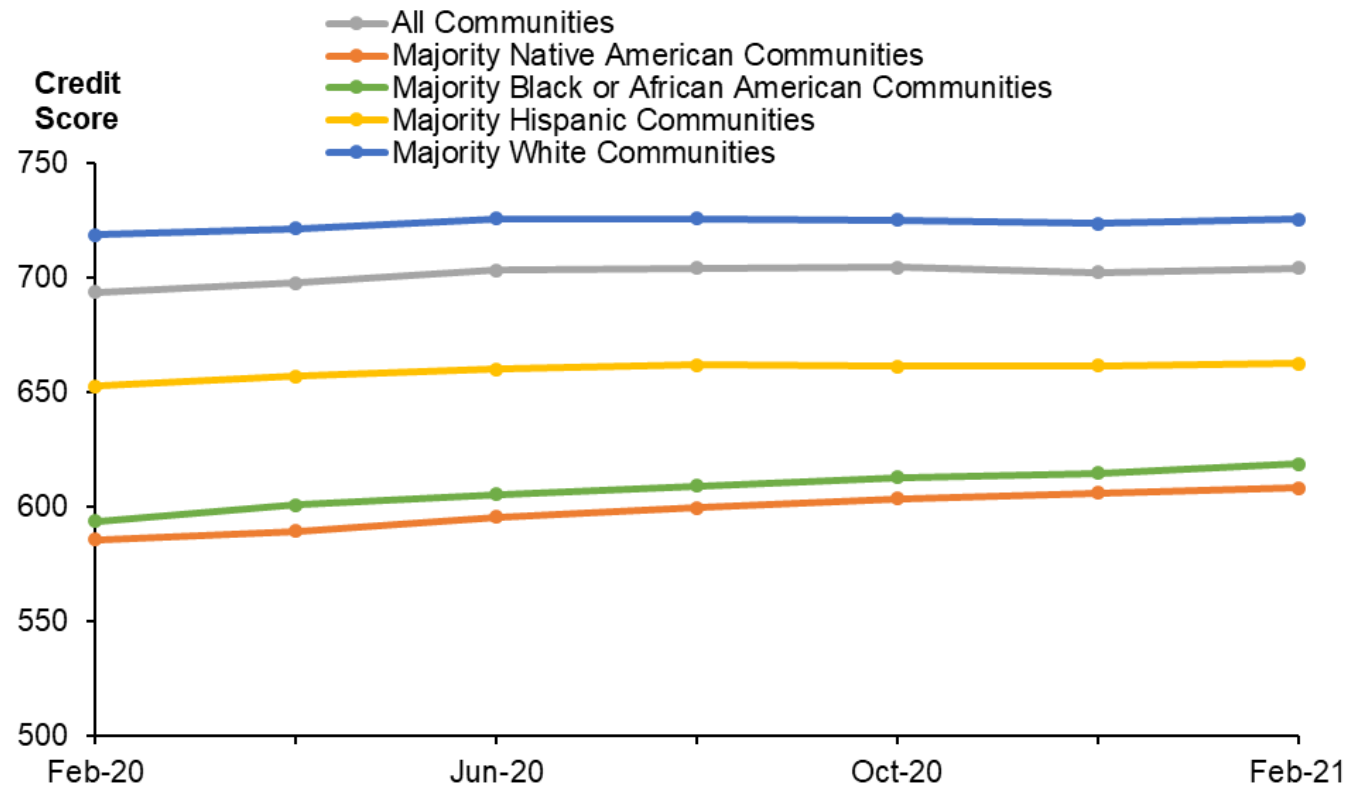
	Share of Personal Property Loans (vs Real Estate only)	Compared to All Households	Total Loans in Cohort (Personal Property and Real Estate)
All Households	42.8%	-	130,570
Low-Income Households	45.4%	+2.6%	65,583
Very Low-Income Households	45.1%	+2.3%	19,786
Hispanic	53.8%	+11.0%	16,224
Low-Income Hispanic Households	55.1%	+12.3%	8,406
Black or African American	65.1%	+22.3%	8,998
Low-Income Black or African American Households	66.7%	+24.0%	5,841
American Indian or Alaskan Native	54.7%	+11.9%	1,551
Low-Income American Indian or Alaskan Native Households	56.2%	+13.4%	840
Asian	48.6%	+5.9%	1,220

Sources: 2021 Home Mortgage Disclosure Act, United States Census Bureau.

Low-Income and Minority Households Face Higher Borrowing Costs than the Median Household

- Residents of majority-minority communities tend to have lower credit scores than compared to white communities and the national average
- Low-income and minority buyers tend to face higher interest rates

Credit Scores of Residents in Majority-Minority Communities



Sources: Urban Institute Credit Bureau Data; 2021 Home Mortgage Disclosure Act.

The Negative Impact of DOE's Proposed Rule Can Be Illustrated With a Few Representative Borrowers

Quoted Rates from 21st Mortgage's Payment Estimator Help to Approximate Current Loan Terms

- The following slides illustrate several groups of representative borrowers, which differ according to the following characteristics:
 - City [E.g., Memphis, TN (Climate Zone 2)]
 - Credit Score [E.g., 650-680]
 - Home Cost [E.g., \$100,000]
 - Down Payment [E.g., 10%]
 - Loan Type [E.g., Home-only (Private Land)]
- 21st Mortgage's "Payment Estimator" tool estimates interest rates and loan terms, given these characteristics, which we then use to calculate LCC values
 - 21st Mortgage is the largest manufactured-home lender in the country, so rates give a general sense of terms facing a current prospective manufactured homebuyer
- Credit score and energy consumption patterns by geography are key drivers of differences in anticipated savings for prospective multi-section home buyers

Geographic Energy Consumption Patterns Drive Considerable Differences Across Cities for Prospective Tier 2 Borrowers

Buyers with Good Credit Would Have Significantly Negative LCC in Most Cities

Profile	Memphis	Miami	El Paso	Houston	Phoenix	Baltimore
City	Memphis (Climate Zone 2)	Miami (Climate Zone 1)	El Paso (Climate Zone 2)	Houston (Climate Zone 1)	Phoenix (Climate Zone 2)	Baltimore (Climate Zone 3)
Credit score	650-680	650-680	650-680	650-680	650-680	650-680
Home cost	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000
Down payment	10%	10%	10%	10%	10%	10%
Loan type	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)
Quoted rates (21st Mortgage)						
Interest rate	9.35%	9.35%	9.35%	9.35%	9.35%	8.60%
Term	25 years	25 years	25 years	25 years	25 years	25 years
10-year LCC						
Given DOE Assumptions	-\$ 66	-\$ 612	-\$ 280	-\$ 29	-\$ 448	\$ 366
Updated EEM Costs, Energy Prices	-\$1,586	-\$2,077	-\$1,821	-\$1,462	-\$1,985	-\$ 988
30-year LCC*						
Given DOE Assumptions	\$1,712	\$ 605	\$1,323	\$1,638	\$1,052	\$2,452
Updated EEM Costs, Energy Prices	-\$ 143	-\$1,206	-\$ 565	-\$ 119	-\$ 837	\$ 773

Notes: Asterisk (*) indicates that estimates are from DOE's original model, i.e., without a correction for an error where loan payments after Year 15 are not included in the LCC calculation for personal property loans. Quoted rates are for a single applicant. From HMDA, roughly 58% of applications are from single applicants. Source: 21st Mortgage Corporation, Payment Estimator, accessed November 7, 2022, available at <https://www.21stmortgage.com/web/payment-estimator.nsf/q1.html>; U.S. Department of Energy, Manufactured Housing Life-Cycle Cost Analysis (LCC) Spreadsheet, May 18, 2022, available at <https://www.regulations.gov/document/EERE-2009-BT-BC-0021-1996>.

Excellent-Credit-Score Borrowers are the Only Credit Score Group with Positive Tier 2 10-Year LCCs (e.g., Memphis)

Based on Industry Interviews, Only 1/3 of MH Buyers Have Credit Scores Over 675

Profile	Poor Credit	Average Credit	Good Credit	Good Credit	Excellent Credit	Excellent Credit
City	Memphis	Memphis	Memphis	Memphis	Memphis	Memphis
Credit score	Under 600	600-650	650-680	680-700	700-750	750+
Home cost	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000
Down payment	10%	10%	10%	10%	10%	10%
Loan type	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)	Home only (Private Land)
Quoted rates (21st Mortgage)						
Interest rate	11.45%	10.10%	9.35%	9.35%	8.35%	8.35%
Term	25 years	25 years	25 years	25 years	25 years	25 years
10-year LCC						
Given DOE Assumptions	-\$ 578	-\$ 259	-\$ 66	-\$ 66	\$ 209	\$ 209
Updated EEM Costs, Energy Prices	-\$2,202	-\$1,818	-\$1,586	-\$1,586	-\$1,252	-\$1,252
30-year LCC*						
Given DOE Assumptions	\$ 630	\$1,288	\$1,712	\$1,712	\$2,355	\$2,355
Updated EEM Costs, Energy Prices	-\$1,255	-\$ 578	-\$ 143	-\$ 143	\$ 516	\$ 516

Notes: Asterisk (*) indicates that estimates are from DOE's original model, i.e., without a correction for an error where loan payments after Year 15 are not included in the LCC calculation for personal property loans. Quoted rates are for a single applicant. From HMDA, roughly 58% of applications are from single applicants. **Source:** 21st Mortgage Corporation, Payment Estimator, accessed November 7, 2022, available at <https://www.21stmortgage.com/web/payment-estimator.nsf/q1.html>; U.S. Department of Energy, Manufactured Housing Life-Cycle Cost Analysis (LCC) Spreadsheet, May 18, 2022, available at <https://www.regulations.gov/document/EERE-2009-BT-BC-0021-1996>.

Summary of Preliminary Conclusions

DOE's conclusions on cost effectiveness disregard or do not sufficiently consider variation in key cost inputs over time and across groups for buyers and suppliers

1 Inflation and Cost Increases

DOE has failed to consider the impacts of considerable cost increases and supply chain constraints. Taking these into account, DOE's conclusion is invalid and the rule has a net cost to consumers rather than a benefit.

2 Negative and Inequitable Impacts

DOE has failed to consider negative impacts on low-income and minority homebuyers.

3 Affordability and Credit Access

DOE has underestimated potential impacts on credit access and lost sales.

4 Additional Costs

DOE has failed to consider potential costs of testing and compliance, transportation, and supply chain constraints.

Increased Costs Will Likely Impact Ability to Qualify for Financing

- Debt-to-income ratio is one of the top reasons why potential buyers of manufactured homes are denied loans
 - In 2021, **42 percent** of denied loans for MH purchases listed the applicant's debt-to-income ratio as a reason for denial
- The cost of owning a new manufactured home has increased by over 40 percent since 2020, according to an industry source
 - Additionally, the cost of construction materials has increased by at least 35 percent since 2020, increasing the cost of compliance
 - Together, these two factors are likely to increase the debt-to-income ratio for potential applicants for manufactured home loans, increasing the likelihood of loan denial
- Minority buyers tend to have lower incomes, and therefore the impacts of the rule have the potential to fall disproportionately on historically marginalized communities
 - Low-income buyers are likely to be disproportionately impacted for similar reasons

Sources: 2021 Home Mortgage Disclosure Act, Industry Interviews.

DOE's Reliance on Elasticity of Demand Estimates Understates Likely Impact on Affordability & Housing Access

- DOE has likely underestimated the affordability impact by assuming **relatively low price-sensitivity**
 - For example, AG's updated EEM cost estimates suggest that the cost of Tier 2 homes will increase by **6.1 percent**
 - Under DOE's assumption, a 6.1 percent increase in price leads to **2.9 percent fewer sales annually**
 - However, according to 2021 estimates of price sensitivity by the National Association of Home builders, the same 6.1 percent increase in price would lead to **6.4 percent fewer sales annually**
 - DOE's own sensitivity analysis, based on a study HUD has cited in prior rulemakings, suggests that this 6.1 percent price increase would lead to **14.6 percent fewer sales annually**
- Additionally, DOE has likely underestimated impacts on affordability due to:
 - DOE has arguably **underestimated compliance costs** and the expected increases in MH prices due to the rule
 - The **recent increase in retail prices** of MHs may have made ownership unaffordable for many consumers already
 - Consumers may be increasingly sensitive to price increases at higher baseline prices
- DOE's assumption understates the decreased demand by *thousands* of potential manufactured home buyers per year, all of whom would have to choose from worse alternatives

Sources: DOE Technical Support Document, pp. 8-3, 10-7 – 10-9; NAHB (2021); EERE-2009-BT-BC-0021-1997_content, Sheet "Price Elasticity," Cells E3:E4; AG Calculations.

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DOE Has Not Accounted for Costs of Testing and Compliance, Which Could Entirely Offset Anticipated Life-Cycle Cost Savings

- DOE has not specified requirements for duct system testing and air leakage testing, which are required by the IECC
- The costs of these possible testing requirements were also not included in DOE's LCC analyses
- Industry interviews have suggested that the costs of compliance may range up to and possibly **over \$1,000/house** for in-field testing of homes in more remote locations
- A \$1,000 testing cost could nearly wipe out anticipated savings across all tiers and analysis periods

DOE and Adjusted LCC Values, by Tier and Analysis Period

	10-Year LCC		30-Year LCC*	
	Tier 1	Tier 2	Tier 1	Tier 2
DOE LCC	\$720	\$743	\$1,594	\$3,573
Adjusted LCC	\$549	-\$647	\$1,395	\$1,361
Adjusted LCC, with \$1,000 Testing Cost	-\$194	-\$1,330	\$426	\$338

Note: Asterisk (*) indicates that the 30-year LCC estimates rely on DOE's original model, which erroneously excludes mortgage payments after the 15th year of personal property loans and therefore overestimates anticipated savings.

Transportation Costs May Further Reduce or Negate Anticipated Savings

- Interviews with industry experts, as well as public comments submitted to DOE, have suggested that DOE has underestimated additional transportation costs due to additional height and weight required to comply with the rule
 - Additional insulation and framing requirements may increase the weight of manufactured homes, requiring an additional axle, which may cost **at least \$400 to \$500/multi-section house**
 - The rule may require homes in CZ2 and CZ3 to use 2' x 6' studs instead of standard 2' x 4' studs, which increases package height. Height increases may require re-routing deliveries around areas with height restrictions, such as in the Northeast
- Additionally, transportation costs have increased in general during the pandemic, e.g., as fuel and labor costs have increased
- Incremental transportation costs were not included in DOE's LCC estimates

Pandemic-Related Supply Chain Shortages May Persist into 2023

- Industry interviews have predicted that pandemic-related supply chain shortages are likely to persist into 2023
 - For example, one interview noted that there were already insulation shortages, with additional cost increases coming in January 2023
 - New fiberglass insulation plants are capital-intensive and take time to build, and therefore insulation shortages are likely to persist in the medium term
 - Therefore, increased demand from the manufactured housing sector due to the DOE rule may further exacerbate existing insulation shortages
 - Without sufficient fiberglass insulation, manufacturers may be forced to substitute to spray foam insulation for parts of the production process, increasing costs significantly and reducing the total number of homes that can be produced per day
- Additionally, CBRE has predicted that pandemic-related delays and labor shortages will continue in the short term