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Chairman Duncan, Ranking Member DeGette, and Members of the Subcommittee, thank you for the opportunity to testify before you today. My name is Gene Rodrigues, and I am the Assistant Secretary of the Office of Electricity (OE) at the Department of Energy. The Department does not have an official position on the bills you are considering today, but I will share some information that may assist in the Subcommittee's deliberations.

Reliability, Resilience, Security, and Affordability

Reliability, resilience, security, and affordability are the core tenants of the Office of Electricity and the Department of Energy. Since I was unanimously confirmed in January of this year, I have overseen the critical work of the Office of Electricity to provide a reliable grid for the American people.

Supply Chains for Distribution Transformers

Causes of Supply Chain Constraints

Concerns regarding distribution transformer availability have been ongoing since 2020. The power sector is experiencing long manufacturer lead-times to fulfill orders of distribution transformers for utilities, which is now taking up to two years compared to 2 to 4 months in 2019. DOE has been working with power sector partners to better understand the underlying issues and identify potential solutions.

There are three main chokepoints causing the distribution transformer shortage: labor, supply-demand mismatch, and material availability. Higher rates of worker turnover, persistent vacancies, and long training periods are contributing to the labor shortage. Recent increases in demand have outpaced supply—which DOE believes will persist as the grid evolves rather than being a one-time cyclical increase.

DOE Stakeholder and U.S. Government Engagement

Following proactive discussions with the electric sector in late 2021, DOE and the Electricity Subsector Coordinating Council (ESCC), a CEO-led group that serves as the principal liaison between the federal government and the electric power industry, jointly formed a Supply Chain Tiger Team to identify root causes of the supply chain issues, develop solutions that could help to address this issue and ensure grid reliability. Distribution transformers were identified early in the process as a critical area of concern in the supply chain, as they are the final step to get power to homes and businesses.

In 2023, DOE convened a working group with distribution transformer manufacturers, U.S. utilities, other supply chain stakeholders, and leaders from across the U.S. government to inform strategies for federal government engagement, encourage industry action, and identify ways that the electric sector can help encourage new industry investments. This working group is an ongoing collaboration between DOE, U.S. Government partners, and industry, and represents a solutions-focused collaboration that builds upon the work started by the supply chain tiger team. In order to ensure the reliability of the grid, we cannot just focus on the near-term pressures, we must also look to how to permanently alleviate supply chain constraints in the long term. Expanding our domestic manufacturing industry is one of the best ways to ensure the security of our grid supply chains, and not rely on foreign channels. DOE is working with its federal partners at the National Economic Council, Department of Commerce (DOC) and DOC's National Institute of Standards and Technology (NIST), and the Department of Labor (DOL) to identify a range of potential resources and actions—including elevating existing best practices, tools, and resources to ensure the resiliency of our grid and relevant supply chains, identifying existing programs and funding streams at DOE and across the administration that can help alleviate the key problem areas, and advocating for priority uses of any additional funding or authorities from Congress.

Relevant Statutory Programs with Near Term Support

Our sister office of Manufacturing and Energy Supply Chains (MIESC) in the Undersecretary for Infrastructure's office supports deployment-level programs to provide America the solutions it needs today for grid management. MESC administers rebates and supports the administration of tax credits that relate to transformers. MESC is also authorized to administer the Defense Production Act (DPA) Title III authorities for grid components, including transformers, but does not currently have appropriated funds to do so.

Transformer rebates - In August 2023, DOE's Office of Manufacturing & Energy Supply Chains (MESC) announced a $10 million rebate program to replace aging and inefficient transformers with new, qualified energy efficient models, as directed and funded by the Bipartisan Infrastructure Law.[1] Transitioning to these newer models will reduce overall power consumption and emissions while cutting operation costs and delivering consumers savings in

[1] U.S. Department of Energy, Office of Manufacturing and Energy Supply Chains, "New 48C Tax Credit Will Spur Historic Investments in Manufacturing and Critical Materials," (May 31, 2023), available at https://www.energy.gov/mesc/articles/new-48c-tax-credit-will-spur-historic-investments-manufacturing-and-critical#:~:text=The%20Qualifying%20Advanced%20Energy%20Project%20Credit%20%2848C%29%E2%80%94established%20by,U.S.%20industrial%20competitiveness%20and%20clean%20energy%20supply%20chains.

the form of lower utility bills. The application portal[2] for distribution transformer rebates has been open since August 1, 2023 and will remain open through December 31, 2023.

48C Tax Credit - The Qualifying Advanced Energy Project Credit (Internal Revenue Code section 48C) was established by the American Recovery and Reinvestment Act of 2009 and was expanded by Section 13501 of the Inflation Reduction Act of 2022, which added an additional $10 billion of income tax credits to be allocated among qualifying applicants. The provision provides tax credits for clean energy manufacturing and recycling projects; critical materials refining, processing, and recycling projects; and projects to reduce greenhouse gas emissions at industrial or manufacturing facilities. A minimum of $4 billion of the $10 billion in Section 48C credits must go to projects located in certain communities impacted by coal plant or coal mine closures.[3] MESC is supporting the IRS on the tax credit's execution and technical understanding of projects because Section 48C plays a critical role in strengthening U.S. industrial competitiveness and clean energy supply chains while creating high-quality jobs and ensuring no community is left behind in the transition to clean energy technologies. Taxpayers are allocated Section 48C credits through an application process, and the Treasury Department and the IRS anticipate at least two allocation rounds. IRS Notice 2023-44 identifies Round 1 supply chain priorities for the Section 48C program, which include electric grid components, such as manufacturing of transformers, materials (including electrical steel, amorphous alloy), power electronics, and other grid components and equipment (including medium voltage direct current (MVDC)/high voltage direct current (HVDC) converter station components and switchgears).

DOE's Energy Conservation Standards Program

General Information

Energy conservation standards are one of the federal government's most important tools to save energy in homes and businesses nation-wide. The Energy Policy and Conservation Act (EPCA), signed into law in 1975, established a federal program consisting of test procedures, labeling, and energy targets for consumer products and equipment. Since the program's inception, the cumulative utility bill savings to consumers resulting from appliance standards are estimated to be more than $1 trillion by 2020 and more than $2 trillion by 2030.[4] As consumers replace their appliances with newer models that comply with the standards adopted since 1975, by 2030, households can expect to save over $529 annually. These standards are intended to increase the nation's energy security while protecting the environment and lowering consumer costs over the

[2] U.S. Department of Energy, Transformer and Extended Product System Rebates Portal, available at https://doerebates.my.site.com/rebates/s/.
[3] U.S. Department of Energy, Office of Manufacturing and Energy Supply Chains, "New 48C Tax Credit Will Spur Historic Investments in Manufacturing and Critical Materials," (May 31, 2023), available at https://www.energy.gov/mesc/articles/new-48c-tax-credit-will-spur-historic-investments-manufacturing-and-critical#:~:text=The%20Qualifying%20Advanced%20Energy%20Project%20Credit%20%2848C%29%E2%80%94established%20by,U.S.%20industrial%20competitiveness%20and%20clean%20energy%20supply%20chains.
[4] U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, "Saving Energy and Money with Appliance and Equipment Standards in the United States," (updated Jan. 2017), available at https://www.energy.gov/eere/buildings/articles/appliance-and-equipment-standards-fact-sheet.

long term. Improvements in energy efficiency can be made today to yield significant near-term and long-term economic and environmental benefits for the nation.

In addition, DOE's energy conservation standards provide certainty and uniformity for industry. Our test procedures ensure all covered products sold in the United States are evaluated against the same methods and criteria, so that consumers and industry can compare competing models and make informed purchasing decisions based on energy efficiency. National test procedures and energy standards preempt a patchwork of product efficiency regulations across the United States, ensuring manufacturers do not have to develop and market separate types of products to sell in various states, and reduce compliance costs.

The Department's Energy Conservation Standards program is just one among a number of federal programs to make our nation's homes and offices more energy efficient while lowering long-term energy costs for consumers and businesses. These efforts include promoting and implementing energy efficiency policies and practices; strengthening consumer education and outreach on energy efficiency as a cost-saving resource; and accelerating market adoption of energy efficient technologies that save families and businesses money.

Process for issuing energy conservation standards

EPCA requires DOE to review at least once every six years the existing standards for covered products and determine, based on an analysis of statutory criteria, whether to amend the existing standard or to determine that the standards do not need to be amended.

Under EPCA, DOE may not prescribe a standard if DOE determines by rule the standard is not technologically feasible or not economically justified or does not result in significant conservation of energy.[5] In deciding whether a proposed standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens.[6] DOE must make this determination after receiving comments on the proposed standard, and by considering, to the greatest extent practicable, the following seven statutory factors:

1. The economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;
2. The savings in operating costs throughout the estimated average life of the covered products in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of the standard;
3. The total projected amount of energy (or as applicable, water) savings likely to result directly from the imposition of the standard;
4. Any lessening of the utility or the performance of the covered products likely to result from the imposition of the standard;

[5] 42 U.S.C. 6295(o)(3)(B).
[6] 42 U.S.C. 6295(o)(2)(B)(i).

5. The impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard;
6. The need for national energy and water conservation; and
7. Other factors the Secretary [of Energy] considers relevant.

The Department evaluates these factors qualitatively and quantitatively and presents its analysis in the proposed and final rules themselves, along with any other notices the Department publishes in the rulemaking process, such as requests for information (RFIs), preliminary analyses, and notices of data availability (NODAs). The Department uses comments and data received from stakeholders to inform their findings with regards to these seven factors during both the process of developing the proposed rule, and when receiving and analyzing comments on a proposed rule in making any final decisions about the standard.

DOE's energy conservation standards apply to products manufactured (or imported) after a period of time once a final rule is published in the Federal Register. Any DOE conservation standard under these provisions cannot and will not apply retroactively to products already purchased by the consumer.

In addition, when evaluating and establishing energy conservation standards, DOE may establish separate standards for a group of covered products (*i.e.*, establish a separate product class) if DOE determines separate standards are justified based on the type of energy used, or if DOE determines a product's capacity or other performance-related feature justifies a different standard.[7] In making a determination whether a performance-related feature justifies a different standard, DOE must consider such factors as the utility of the feature to the consumer and other factors DOE determines are appropriate.

Where possible, the Department adopts a new or amended standards based on the receipt of a private consensus agreement or by entering into a negotiated rulemaking with a group of representative stakeholders. In 2007, Congress recognized the importance of consensus or negotiated standards, amending EPCA to allow for an expedited rulemaking process in the event a representative group of stakeholders could reach agreement.

Sometimes the Department evaluates a product and determines the evidence does not support more stringent energy standards because new standards are not technologically feasible, economically justified, or would not result in significant energy savings. In these instances, after receiving public comment, the Department will proceed through a final determination that simply states a more stringent standard is not justified.

The standards rulemaking proceedings are transparent. Proceedings are recorded at the Federal eRulemaking Portal at www.regulations.gov with a separate docket for each rulemaking. DOE hosts public meetings for its standards rulemakings and offers a webinar version to maximize the number of participants who can attend from across the country. Comments received at public meetings and through the notice and comment periods are posted to the docket. The formal

[7] 42 U.S.C. 6295(q).

rulemaking documents, including notices of proposed rulemaking, supplemental notices of proposed rulemaking, final rules, and notices of data availability, are published in the Federal Register and timely posted on the Department's website. In these materials, the Department includes detailed discussion on its methodology, how the projected energy and cost savings associated with various policy scenarios were determined, and how those figures support the overall technical feasibility and economic justification for a proposed standard. Such rulemaking documents include analysis on projected impacts, including on consumers, the nation, manufacturers, greenhouse gas emissions, employment, and small businesses. DOE also routinely contacts any interested stakeholders via dozens of appliance-specific listservs.

Distribution Transformers Rulemaking

On January 11, 2023, the Department proposed energy conservation standards for three classes of distribution transformers:

- Liquid immersed
- Low-voltage dry-type
- Medium voltage dry-type.

On January 11, 2023, DOE proposed amended standards for distribution transformers and sought comment from interested parties on the proposal as well as a variety of key issues relating to the steel market.[8] DOE held a public hearing on February 16, 2023, and the comment period closed on March 27, 2023, including an extension as requested by stakeholders. DOE's consideration of any amended standard for distribution transformers is still underway. As part of the proposal, DOE expressly sought comment on the timing of any transition needed to support compliance with the proposed rule. DOE is carefully considering the comments and data submitted by over 70 stakeholders and the feedback from our public hearing. DOE emphasizes that every comment offered—including questions about the estimated efficiency benefits—will be given due consideration before any final decisions are rendered. DOE is conducting this rulemaking on distribution transformers as a result of the Department's statutory obligations and a consent decree deadline requiring the final rule to be completed by June 2024. Congress also requires DOE to review the standards once every 6 years and DOE last reviewed distribution transformer efficiency standards in 2013.

If finalized as proposed, these standards would not apply to products manufactured or imported into the United States until at least 3 years after a final rule is published in the Federal Register. If the rule is finalized according to the efficiency levels outlined in the proposed rule:

- American consumers would save up to $1.5 billion per year in 2021 dollars.
- DOE's proposed standards would reduce distribution transformer losses by over 20% resulting in annualized savings of 34 billion kWh per year - an amount sufficient to power over 3 million houses for a year.

[8] https://www.federalregister.gov/documents/2023/02/22/2023-03547/energy-conservation-program-energy-conservation-standards-for-distribution-transformers-extension-of

- DOE estimates that the cumulative energy savings of new, efficient equipment sold over a 30-year period will exceed 3 trillion kWh—enough energy to power all homes in the U.S. for 2.3 years.
- Over thirty years of shipments, the proposed standards would:
  - Save the equivalent of the electricity use of all U.S. households for 2.3 years.
  - Save American consumers $26.6 billion on their energy bills.
  - Eliminate 338 million metric tons of CO2 emissions.

Many distribution transformers sold today are more than 99% efficient—meaning that they waste less than 1% of the electrical energy that flows through them. This can seem like a small amount of energy when expressed as a percentage, but the amount of wasted energy adds up to an enormous number considering that most electricity in the nation flows through distribution transformers. Total U.S. electricity consumption in 2022 was about 4 trillion kWh—a large number which is projected to increase over time with population and economic growth, and as the nation moves toward a more electrical-based society. When making its final regulatory determination about these critical devices, DOE will consider what is technologically feasible, economically justified, and whether a particular standard would result in significant energy savings, as required by EPCA. In addition, DOE continues to emphasize the importance of reliability, resilience, and security of the grid as a Departmental priority across all its workstreams.

Conclusion

DOE is continually working to enhance energy efficiency and to secure American supply chains of critical energy technologies. This directly contributes to the reliability, resilience, security, and affordability of the grid, upon which our economy, national security, and overall well-being depends. I appreciate the opportunity to provide more information on DOE's distribution transformers supply chain work and our energy conservation standards program, and I am happy to answer questions Committee Members may have.