

**Supplementary Comments on  
Standards for Distribution Transformers  
Docket EE-RM/STD-00-550**

March 12, 2007

**A. Introduction and Overview**

The Natural Resources Defense Council, the Edison Electric Institute, the Alliance to Save Energy, the American Council of an Energy Efficient Economy, the American Public Power Association, the Appliance Standards Awareness Project and the Northeast Energy Efficiency Partnerships are pleased to present this letter to supplement the joint recommendation provided to the Department of Energy (DOE) on February 9, 2007. In that letter, the signers recommended a two-stage liquid immersed distribution transformer standard (referred to hereafter as the “Joint Proposal”) which would implement the TSL 2 minimum efficiency levels with a compliance date of January 1, 2009 and the TSL 4 minimum efficiency levels with a January 1, 2013 compliance date. This letter also responds to the Notice of Data Availability (NODA) and Request for Comment published by DOE on February 9, 2007 (72 FR 6188).

We are heartened by DOE’s statements in the NODA indicating that the agency is considering higher efficiency levels than initially proposed, up to and including TSL 4 (72 FR 6189). We strongly recommend the two-stage approach that was outlined in our February letter and further supported in this letter as the efficiency standard that best meets the EPCA requirements.

According to DOE’s National Impact Analysis spreadsheet, published as part of the Notice of Proposed Rulemaking (NPR) record, the Joint Proposal would save approximately 3.39 quads of primary energy over the period 2009 to 2038 with significant net economic benefits for the nation.<sup>1</sup> In addition to these significant energy savings, there are several notable benefits and features of the Joint Proposal. With an initial compliance date of 2009, the recommended standard begins to achieve energy savings relatively soon. By increasing to the higher, TSL 4 efficiency levels effective January 1, 2013, the recommendation locks in very large mid- and long-term energy savings while allowing additional time for transformer manufacturers and their materials suppliers to prepare for the stronger standard level. This additional time is intended to allow an orderly and cost-effective implementation of any necessary manufacturing investments and thus mitigate impacts on manufacturers and their suppliers. In addition, it will allow time for technological developments that could enhance manufacturers’ ability to meet the level 4 efficiency levels for the full range of distribution transformers covered by the proposal.

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<sup>1</sup> We calculated these savings by running DOE’s national impact analysis spreadsheet developed for the NPR.

## **B. The Joint Stakeholders to the Agreement**

Natural Resources Defense Council (NRDC) is a national environmental organization with over 550,000 members and contributors. NRDC has promoted energy efficiency at the state, regional, national and international level for over 20 years and has participated in DOE appliance efficiency rulemakings since 1980 and in state appliance efficiency proceedings since 1975.

The Edison Electric Institute (EEI) is the association of United States shareholder-owned electric companies, international affiliates, and industry associates worldwide. Our U.S. members serve 97 percent of the ultimate customers in the shareholder owned segment of the industry, and 71 percent of all electric utility ultimate customers in the nation. They generate almost 60 percent of the electricity produced by U.S. electric generators.

The American Public Power Association (APPA) serves the nation's more than 2,000 not-for-profit, community- and state-owned electric systems. Public power systems serve 44 million people in 49 states, or about 15 percent of all electricity customers. They own about 10 percent of the nation's generating capacity.

The Alliance to Save Energy (ASE) is a coalition of prominent business, government, consumer and environmental leaders who promote the efficient and clean use of energy worldwide to benefit the economy, environment, and national security. For more than 20 years, the Alliance has worked to make the benefits of energy efficiency understood and practiced in the United States and around the world. The Alliance has been active in the development and passage of energy standards laws and appliance standards proceedings.

The American Council for an Energy Efficient Economy (ACEEE) is a non-profit organization dedicated to advancing energy efficiency as a means of promoting economic prosperity and environmental protection. ACEEE was very involved in the development, negotiation and passage of NAECA and the efficiency provisions of both EPAct 1992 and EPAct 2005 as well as all DOE appliance standards rulemakings completed pursuant to these acts.

The Appliance Standards Awareness Project (ASAP) is dedicated to increasing awareness of and support for energy-saving appliance and equipment efficiency standards. Founded in 1999, ASAP is led by a steering committee that includes representatives from the environmental community, consumer groups, utilities and state government.

Northeast Energy Efficiency Partnerships, Inc. (NEEP) is a regional nonprofit organization founded in 1996 whose mission is to promote energy efficiency in homes, buildings and industry in the Northeast U.S. through regionally coordinated programs and policies that increase the use of energy efficient products, services and practices, and that help achieve a cleaner environment and a more reliable and affordable energy system.

In this document, we refer to the group of organizations which signed the February 9<sup>th</sup> letter to DOE as the "Joint Stakeholders." These organizations have been stakeholders in a wide range of DOE appliance standards, research and development, utility incentive and demand side

management activities, with many of these groups active for twenty years or more. The Joint Stakeholders represent a broad spectrum of interests and points of view. Significantly, EEI and APPA together represent the electric utility customers which purchase and use about 80% of the liquid-filled distribution transformers in the Nation. These customers will eventually bear the costs and benefits of implementing the new efficiency standards which we advocate.

### **C. Background for Our Proposal**

EEI, NRDC and others participating in this recommendation entered into informal discussions on distribution transformer standards for several reasons. First, the parties believed that a negotiation among these stakeholders might help resolve the standards issue and allow DOE to proceed expeditiously to a final rule. Second, informal discussions allow stakeholders to share information and develop creative approaches, both regulatory and non-regulatory, which are more difficult to develop and discuss in normal notice and comment rulemaking. This process resulted in the recommendation for a two-step approach to the standard and a recommendation for a DOE technical conference in 2010.

The Joint Stakeholders proposal should weigh heavily with DOE since it represents a broad set of interests inclusive of the actual purchasers (we estimate that EEI and APPA purchase 80%) of liquid-filled distribution transformers. In addition, the National Association of Regulatory Utility Commissioners (NARUC) has endorsed the two-stage standard as shown in their resolution approved on February 21, 2007 (see attachment C). NARUC is the national association of state and federal utility regulatory commissioners. Its position is significant since the distribution business of the investor-owned utility segment of the industry (which serves about 71 percent of the ultimate electricity consumers in the Nation) is subject to rate regulation by state public utility commissioners who are members of NARUC. Generally, their job is to assure, among other things, that utilities provide safe, reliable and adequate service at just and reasonable rates based on prudent investments consistent with the public interest. Thus, they serve to represent the ultimate consumer of electricity.

### **D. The Joint Stakeholders' Proposal**

The proposal contains two major components – compliance dates and standard levels. As noted above, the proposed compliance date for TSL 2 of January 1, 2009 is designed to achieve energy savings relatively soon by implementing a standard widely met today according to DOE's published analysis. According to DOE's analysis, on a sales-weighted average basis, more than half of current transformer sales comply with TSL 2 efficiency levels, thus eliminating concerns about technological feasibility and making it possible for the Joint Stakeholders to propose an earlier implementation date. On the other hand, according to the DOE analysis, while the TSL 4 level is also technologically feasible, a smaller proportion of current sales achieve this level. Thus, the January 1, 2013 compliance date for TSL 4 is designed to allow six years for additional development of production capacity and designs which comply with this higher efficiency level as cost-effectively as possible.

The proposed standards are designed to achieve substantial savings relative to the current

market. As shown by DOE's analysis of TSL 5 and TSL 6, efficiency levels above the recommended standards are also possible and, in some cases, cost-effective. The potential market viability of higher efficiency performance levels demonstrates opportunities for manufacturers and utilities to seek even better efficiency performance on a voluntary basis, such as with an updated Energy Star Transformer Program.

DOE has previously established a two-stage standard by rulemaking. In 2001, DOE issued a final rule for residential clothes washers with a two-stage standard (66 FR 3314). An initial stage took effect in 2004 at a Modified Energy Factor (MEF) of 1.04. In January 2007, a second, more stringent stage of MEF 1.26 took effect. In the 2001 rule, DOE concluded,

Nothing in the Act precludes DOE, in carrying out its duty to determine whether to amend the existing standards, from promulgating amendments that take effect in two stages. In this rulemaking, DOE has determined that an interim 2004 standard is technologically feasible and economically justified. This less stringent interim standard gives industry sufficient lead time to depreciate their current assets and plan a more orderly transition of their production facilities. Delaying the implementation date for the higher efficiency level gives manufacturers more time to research and develop lower cost solutions to achieve higher standards (71 FR 3321).

Many of us as well as other stakeholders supported this legal conclusion in 2001. In April, 2001, DOE issued a notice confirming the January 2001 Final Rule. Thus, DOE has concluded that it is legally permitted to establish a two-stage standard as recommended by the Joint Stakeholders.

#### **F. Compliance with EPCA Requirements**

The Joint Proposal comports fully with the standards setting criteria in EPCA and has been "designed to achieve the maximum improvement in energy efficiency" which is "technologically feasible and economically justified" as required by 42 U.S.C. 6295(o)(2). In the NOPR (71 FR 44356), DOE established a maximum level which it considered to be the maximum technically feasible or "max tech" (71 FR 44362). The Joint Proposal makes use of current DOE test procedures, which were agreed to by transformer manufacturers; no test procedure amendments are needed to implement the proposal. The Joint Stakeholders have relied upon these analyses and the technical conclusions which DOE reached to arrive at the Joint Proposal.

Below, the Joint Stakeholders detail the ways in which the Joint Proposal meets the statutory test of being the maximum level which is technically feasible and economically justified, taking into account the societal, consumer and manufacturer interests set forth in 42 U.S.C. 6295(o). DOE's NOPR has already provided the rationale for adopting TSL 2, albeit one year later than we are recommending. Because such a large portion of current sales comply with TSL 2 (nearly 60% on a weighted average sales basis according to DOE), we believe the 2009 date is justified. Transformers are usually a built-to-order product; it should make little difference to manufacturers whether they must comply with TSL 2 levels in 2009 or 2010.

We also believe that DOE is legally permitted to establish an initial compliance date of January 1, 2009. At the NOPR hearing, DOE legal staff (Francine Pinto of DOE's Office of

General Counsel) stated that the statute does not specify a minimum lead time between promulgation of a final rule and compliance date for transformers. However, DOE chose three years because that is the minimum period applied for several other products. (Transcript from Public Meeting on Proposed Energy Conservation Standards for Distribution Transformers, 9/27/2006). We agree with DOE's view that the statute does not specify a minimum lead time for transformers, but disagree with the view that the lead time applied to other products must be applied to transformers. Congress specified lead times for various appliances including three years for some, five for others and as long as eight for still others. Congress has been quite thorough in all amendments to EPCA in setting specific minimum intervals between final rule and compliance dates on a product-by-product basis. If Congress intended DOE to apply a minimum lead time for transformers, it would have set one as it did for nearly all other products. Rather, the timing of the standard must be a factor in judging the factors laid out in 42 USC 6295(o).

Because DOE has already justified TSL 2, we focus in these comments on describing the justification for TSL 4 in 2013. We note however, that the DOE NOPR analysis supposes a 2010 implementation date, three years sooner than the proposal herein for application of TSL 4 efficiency levels. We would expect some of the impacts on manufacturers and product price to be lessened due to the additional three years allowed prior to the TSL 4 compliance date. Nevertheless, the TSL 4 level in DOE's analyses provides a reasonable proxy for evaluating the impacts of the Joint Proposal. Where possible, we have used DOE analysis tools to determine impacts of the joint proposal.

## **1. Economic Impact to Consumers**

In evaluating this criterion, we urge DOE to give great weight to the fact that organizations representing 80% of the purchasers of the distribution transformers at issue in this proceeding support the Joint Proposal. In addition, the national organization of the public utility commissions which regulate the rates and services provided by these customers also supports the Joint Proposal. We believe that such strong support from affected customers is unique and deserves great weight in DOE's balancing process.

The Joint Stakeholders believe that the Joint Proposal's economic effect on consumers is justified and supported by the Department's analysis (42 U.S.C. 6295(o)(2)(B)(i)(I)). The "consumer" for liquid immersed transformers is investor-owned, municipal, and cooperative utility companies. The DOE analysis projects that utilities (and indirectly, their customers) will save billions of dollars under the Joint Proposal.

According to DOE's NOPR, a standard at TSL 4 adopted in 2010 would result in net economic savings over the analysis period of \$11.07 billion with a 3% real discount rate and \$2.26 billion with a 7% real discount rate (2004\$) (71 FR 44393). Using the DOE's National Impact Analysis Spreadsheet published for the NOPR, we calculated the benefits of the Joint Proposal (see attachment A). DOE's analysis shows that the Joint Proposal would yield net economic benefits of \$9.85 billion at a 3% discount rate and \$1.93 billion at a 7% discount rate. This analysis included, consistent with the process rule, consideration of variations in energy

usage and energy prices between purchasers and regions.

The 3% and 7% real discount rates are used by DOE to evaluate options per general guidance from the Office of Management and Budget (OMB). We note that the economic benefits of the Joint Proposal are large at either discount rate. We also note that the DOE analysis estimated a weighted-average cost of capital for investor owned utilities of about 4.15% real and, for publicly-owned utilities, about 4.31% real (71 FR 44377). These rates indicate that the actual net benefits to utilities will be closer to the estimate based on the 3% real discount rate than the 7% real discount rate.

Some utilities represented by the Joint Stakeholders do not necessarily agree with every element of the data, analyses or conclusions contained in the economic analysis. Certainly, the analysis may be subject to additional refinement in the Final Rule stage of the rulemaking. For example, the NOPR analysis was based on AEO 2005 electricity price projections. Presumably the Final Rule will be based upon the latest AEO projections. In addition, individual company projections vary from the averages calculated by DOE. We recognize these differences can occur because of variations in important inputs and assumptions such as: the costs of electricity throughout the Nation as opposed to individual companies, the projected costs of electricity in the future, the assumptions made about the governmental rules and requirements that will affect electric generation costs, the projected costs of needed materials for distribution transformers, especially in light of worldwide demand, and other projected cost factors. However, the Joint Stakeholders agree that the Department has made a fair and reasonable estimate, based on data available to it on a Nationwide basis. Nevertheless, given the fact that no estimate of costs and prices over 30 years is perfect and given some participants' concerns over cost issues, the Joint Stakeholders further concluded that the potential for the TSL 4 standard to be cost-effective would be enhanced substantially by the provision of additional time for manufacturers to adjust to the TSL 4 standard because this would help mitigate manufacturer adjustment burdens and allow more time for marketplace innovation (42 U.S.C. 6295(o)(2)(B)(i)).

## **2. Economic Impact on Manufacturers**

The DOE's manufacturer impact analysis found that industry value would *increase* by 6.6% (\$34.9 million) under the "Preservation-of-Gross-Margin-Percentage" Scenario and that it would *decrease* by 7.0% (\$36.9 million) under the "Preservation-of-Operating-Profit" Scenario. DOE's analysis also indicates that total industry investment to comply with TSL 4 would be about \$8 million (71 FR 44391).

We believe that these impacts are reasonable and support adoption of the Joint Proposal. DOE scenarios include one showing positive economic impacts for manufacturers. There are good reasons to expect that outcomes showing positive industry impacts are reasonable. Negative industry impacts usually result from lost sales caused by higher product prices. However, in the case of distribution transformers, declines in sales are less likely to occur than in other contexts because utilities must meet growth in their customers demand for reliable distribution service. Moreover, utilities have many incentives to use TSL 4 transformers to increase the efficiency of their distribution systems. Further, NARUC's resolution supporting the

higher level efficiency standards demonstrates the support and commitment of utility regulators to investment in more efficient distribution transformers as well. Finally, if the additional time for implementation of TSL 4 facilitates more innovation, production of needed inputs and continued competition among manufacturers, as we expect, price increases should be restrained.

On the other hand, even in DOE's worst case, the negative impact on industry is heavily outweighed by the energy and economic benefits from the standard. The net present value of the Joint Proposal outweighs DOE's worst case scenario for manufacturer impacts by 277 to 1 (assuming 3% real discount rate) or 52 to 1 (assuming 7% real discount rate).

In addition, the manufacturer impacts are well below those for the most recent DOE rules for other products. For example, for the SEER 13 residential air conditioner and heat pump rule, DOE estimated manufacturer impacts ranged from a gain of 15% (\$237 million) to a loss of 23% (\$362 million) (66 FR 7186). For residential water heaters, DOE scenarios estimated losses at 5% (\$15 million) to 14% (\$44 million) (66 FR 4490). For residential clothes washers, DOE estimated losses at 29.2% (\$421.1 million) to 36.7% (\$528.4 million) (66 FR 3326). These estimates were performed in 1999-2000. Thus, examining just the worst case manufacturer impact scenarios shown by DOE in its 2006 analysis, the impact for transformers (a loss of 7%), is half the loss predicted for water heaters (minus 14%); less than one-third the percent loss predicted for air conditioners (minus 23%) and less than one-fifth the loss predicted for clothes washers. We also note that the cumulative energy saved from the Joint Proposal, 3.39 quads over 28 years, compares favorably to the savings from the water heater rule (4.6 quads), air conditioners and heat pumps (4.2 quads) and clothes washer (5.52 quads) standards. Thus we find the worst-case manufacturer impacts to be within the norm for a major DOE energy savings rulemaking.

Finally, we note that DOE's manufacturer analysis is based on applying TSL 4 in 2010. Delaying the implementation of TSL 4 to 2010 will allow more time for manufacturers to optimize designs and manufacturing processes to meet the standard at minimum costs. It is reasonable to assume that the additional time will further enable the ingenuity of the manufacturers coupled with competitive pressures to further bring down the cost of TSL 4 transformers. As cost declines, so will any negative impacts on sales, implying that the impact of TSL 4 on manufacturers will be reduced by applying this level in 2013 rather than 2010.

However, while the impacts on manufacturers are acceptable at the TSL 4 level, at higher efficiency levels adverse economic impacts on manufacturers could be very significant according to the DOE analysis. At TSL 5, DOE found negative impacts of up to 39% loss of industry value and incremental investments of more than \$200 million. Therefore, the Joint Parties agree that using Level 4 will prevent such an occurrence.

### **3. Life Cycle Costs and Vault Constraint Issues**

DOE's own data indicates that the benefits of the Joint Proposal in savings and operating costs over the average estimated life of the covered product exceed the burdens of increase in price to the greatest extent practicable (42 U.S.C. 6295(o)(2)(B)(i)(II)).

According to DOE, the TSL 4 level was specifically designed around the concept of lowest lifecycle cost. In its analysis, DOE modified the initial level 4 levels downward from levels shown to minimize lifecycle costs to avoid inclusion of efficiency levels that could not be met with conventional transformer manufacturing techniques (77 FR 44378). Thus, TSL 4 is, by DOE's own design, the minimum lifecycle cost level, modified to take into account (i.e. reduce) manufacturer impacts.

For its lifecycle cost analysis, DOE evaluated five sample liquid-immersed transformers, termed "design lines." The results of those analyses are shown in Tables V.1 through V.5 of the NOPR (71 FR 44385). These analyses show that the mean lifecycle cost savings range from \$71 for a 25 kVA single-phase pole-mount transformer to \$7,089 for a 1500 kVA three phase transformer. The sales-weighted average lifecycle cost savings is nearly \$2,400 at TSL 4. DOE found that, on a sales-weighted basis, about 80% of consumers would either be unaffected by the standard or have lower overall lifecycle costs (see attachment B for calculations). Two and one-half times more consumers have lower lifecycle costs than have higher lifecycle costs at TSL 4 levels. We expect that the portion of consumers benefiting will improve further because of the later implementation date.

According to DOE's analyses, TSL 5 is also cost effective on a lifecycle cost basis, yielding savings of \$5 to \$4,431 depending on the design line. However we conclude that consideration of other factors including manufacturer impacts and the availability of equipment meeting TSL 5 indicate that the Joint Proposal using TSL 4 better meets the statutory criteria.

In the February 9<sup>th</sup> NODA and request for comments (72 FR 6186), the department solicited comments on the inclusion of potential costs related to size constraints of transformers installed in vaults, largely in response to questions raised by one of the Joint Stakeholders to this agreement. We support accurate analysis that incorporates the full range of costs and benefits associated with more efficient transformers and strongly appreciate DOE's issuance of the NODA.

With regard to vaults, we have reevaluated our earlier concerns about this issue and do not expect that incorporation of vault related costs are necessary or will materially change the outcome of the DOE analysis. We reach this conclusion for several reasons. First, transformers in vaults represent a relatively small and unique segment of the nation's stock. Howard Industries' comments indicate vault transformers represent only one half of one percent of transformer sales. Second, the data provided in the March 9<sup>h</sup> NODA show a significant range in size for transformers at each efficiency level. For example, for Design Line 4, DOE shows a range in size of 66.41 cubic feet to 91.7 cubic feet. Similarly, for Design Line 5, the smallest transformer is 233.41 cubic feet while the largest is 261.28 cubic feet. Thus, utilities facing space constraints in vaults have choices about the sizes they can order from transformer manufacturers.

Third, in the NODA, DOE identified several options for companies if increased efficiency standards result in a situation where a replacement transformer at level 4 does not fit within the existing vault (72 FR 6189). DOE lists rewind or refurbish of the existing

transformer as an option. Another option is to purchase and install a refurbished or rewind transformer previously used at another location. These options are likely to be less costly than expanding existing vaults. Finally, utilities facing space constraints in vaults should be able to use the DOE exceptions process for relief from any economic and operational hardships that might result if they were forced to reconfigure existing vaults to fit a TSL 4 transformer. We urge DOE to process such requests expeditiously.

These factors all indicate that requiring TSL 4 is likely to trigger vault-size related costs relatively infrequently and that there are reasonable alternatives available, including, if needed, the exceptions process. Accordingly, we have concluded that DOE does not need to further investigate this issue.

#### **4. Energy Savings**

The Joint Proposal would result in very large total projected energy savings ((42 U.S.C. 6295(o)(2)(B)(i)(II)). As documented in attachment A, we used the DOE's National Impact Analysis (NIA) spreadsheet, which forecasts energy savings over the period of analysis for trial standards relative to a base case. The energy savings provided by the Joint Proposal are very significant. The DOE spreadsheet tool estimates savings of approximately 3.39 quads of cumulative primary energy savings for equipment sold between 2009 and 2038. As noted above, these savings compare favorably to other major DOE rulemakings.

#### **5. Lessening of Utility or Performance or Availability of Products**

The Joint Proposal will provide no significant lessening of utility or performance or availability of the covered products as prohibited by 42 U.S.C. 6313 (a)(6). As noted, TSL 4 was specifically designed by DOE to avoid requiring non-conventionally manufactured transformers. In addition, DOE explains in the NOPR that, "For all types of transformers, the Department included extra labor and equipment costs that may be incurred in the installation of larger, heavier, more efficient transformers (71 FR 44394)." Thus, issues of weight and size were largely accounted for in the DOE analysis which showed TSL 4 to be cost-effective. In its February 9<sup>th</sup> Notice, DOE asked for comment on space constrained transformers. As noted above, we think that this issue is unlikely to affect DOE's final standard and in those instances where efficiency standards trigger a space constraint problem, there are several alternative approaches that will enable a utility to meet its transformer needs.

#### **6. Impact of Lessening of Competition**

We believe the Joint Proposal would not support a Department of Justice determination that the standard would lead to the likelihood of reduced competition (42 U.S.C. 6313 (a)(6)). The Joint Proposal was developed in consultation with large and small utility companies who rely on a variety of manufacturers and who would like to see strong competition among such manufacturers in the future. Since our proposal to initiate TSL 2 in 2009 uses existing technology and since many transformer lines already satisfy this standard, we doubt this element of our proposal is likely to reduce competition.

While the technology also exists to produce TSL 4 transformers in many lines at this time, we recognize full, cost-effective implementation may require adaptation by manufacturers. The six year lead time for implementation of TSL 4 is intended to provide adequate time for the full range of manufacturers to make any needed preparations. Indeed, DOE's estimate that industry-wide required investment will be only about \$8 million indicates that no single manufacturer is likely bear such costs as to undermine its viability as an ongoing business concern. Therefore, the Joint Proposal is not expected to limit competition.

In addition, we recommended in our February 9<sup>th</sup> letter that DOE hold a technical conference in 2010. The purpose of this conference is, "to assess progress toward development of any needed technology and production capacity for cost-effectively meeting the 2013 compliance date for the full range of covered applications." This process would provide data that could help inform applications for exception relief. The exception relief mechanism allows DOE to address specific problems, including those related to specialty or niche manufacturers, without holding up a standard that delivers large benefits to the Nation.

## **7. Need of the Nation to Conserve Energy**

All of the Joint Stakeholders agree that as a result of their pervasive and long-term role in the electric delivery system, more efficient distribution transformers can play an important role in increasing the efficiency of the electric grid. As stated in the NOPR, "Enhanced energy efficiency, where economically justified, improves the Nation's energy security, strengthens the economy and reduces the environmental impacts or costs of energy production 71 FR 44394)". The energy savings from the Joint Proposal will result in reduced emissions of CO<sub>2</sub> and NO<sub>x</sub>. DOE estimates that TSL 4 implemented in 2010 would reduce CO<sub>2</sub> emissions by 232.8 million metric tons, NO<sub>x</sub> by 62.8 thousand metric tons and mercury by 4.5 tons over 28 years (71 FR 44397). As noted above, we conclude based on DOE's analytic tools that the Joint Proposal will save 3.39 quads over 2009 to 2038. DOE concludes that TSL 4 implemented in 2010 would save 3.38 quads. Since the quad savings from the Joint Proposal and TSL 4 implemented in 2010 are very similar, we conclude that the cumulative emission reductions would also be very similar.

## **8. Other Factors**

The Joint Proposal will result in significant reductions in peak electrical demand. DOE estimates that TSL 4 implemented in 2010 would offset growth in generation capacity by 6,200 megawatts by 2038, or more than the equivalent of fifteen 400 MW power plants which suggests that the Joint Proposal would eliminate the need for a similar number of power plants.

The Joint Stakeholders Proposal is consistent with the Department's process improvement rule. The Proposal comports particularly with Section 8 of the Rule, which encourages efforts by groups of interested parties to develop and present consensus recommendations on proposals for newly revised standards.

## **9. Balancing the Different Factors**

In balancing the various factors DOE is required to consider, Joint Stakeholders urge DOE to give great weight to the fact that we represent the bulk of the customers who will be directly affected by the standards that we propose.

Under federal law and DOE regulations, DOE needs to set the new standard at the maximum level of energy efficiency that is technically feasible and economically justified. DOE has determined that TSL 6 is the maximum level that is technically feasible for this equipment. Such a level would result in very large energy savings (9.38 quads by 2038 according to DOE's analysis). However, a standard at the level would increase net costs for utilities by \$10.31 billion at 3% discount factor and by \$14.10 billion at 7% discount factor.

The next level DOE examined is TSL 5. This standard would save nearly twice as much energy as TSL 4 (6.51 quads compared to 3.38 quads). It would result in net economic savings of \$9.94 billion at a 3% real discount rate, but net costs of \$1.14 billion assuming a 7% discount rate. We note, however, that a discount rate close to the weighted average cost of capital for utilities would likely yield a positive net present value. However, DOE's analysis finds that, depending on the transformer, between 43.9% and 66.3% of utilities would experience higher lifecycle costs. In addition, for many if not most transformers, TSL 5 would require shifting to the use of advanced transformer materials and construction practices not now commonly used in the United States. So, while TSL 5 transformers offer promise for future energy savings, this level is not currently appropriate as the basis for a national mandatory minimum efficiency standard.

As shown above and in the NOPR, the TSL 4 level would result in very large energy savings (3.38 quads by 2038). According to DOE, the potential lifecycle cost savings to purchasers can be substantial, ranging from \$71 to \$7089 on average, depending on the design line. According to DOE, depending on the design line examined, between 59.0% and 91.4% of purchasers are either unaffected by the TSL 4 standard or better off (i.e. they are already buying TSL 4 transformers or they would have lower lifecycle cost if they did). Thus, the majority of purchasers are unaffected or better off, although even under the DOE analysis a few would be worse off. The biggest problem with this estimate is the uncertainty associated with many of the cost-related inputs, causing understandable concern to some Stakeholders that costs will be higher than estimated.

This explains the basis for the joint proposal of TSL 2 effective 2009 and TSL 4 effective 2013. As noted, the Joint Proposal further mitigates the negative impacts of TSL 4 and the potential that DOE's economic analysis is overly optimistic by delaying the implementation date three years. The additional years prior to the TSL 4 compliance date are intended to allow a greater opportunity for manufacturer ingenuity and competitive pressures to help bring down the increased first cost of more efficient transformers. With further declines in first cost, payback periods will be reduced and the portion of utilities either unaffected by the standard or with net lifecycle savings will grow.

Finally, the broad consensus in support of this standard level should allow DOE to move more quickly to a final rule, avoiding lost energy savings and potentially allowing DOE to speed up other rulemakings. We strongly urge DOE to set such a standard with dispatch.

**G. Conclusion**

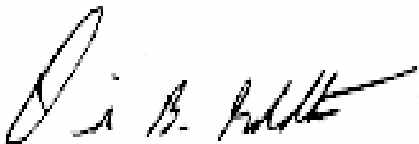
The Joint Stakeholders recommend the Department issue a Final Rule to establish a two stage national standards for liquid immersed distribution transformers, with TSL 2 effective January 1, 2009 and TSL 4 effective January 1, 2013. We also urge the Department to convene a technical conference in 2010 to assess progress toward development of any needed technology and production capacity for cost-effectively meeting the 2013 compliance date.

We believe that the Department can go directly to a final rule because the NOPR showed TSL 4 as a possible standard level and the February 9<sup>th</sup> NODA provided notice that the Department is considering levels more stringent than the initial proposal. However, we also note that, if necessary, the Department could still provide public notice that it is considering the joint recommendation, accept public comment and still meet the deadline of September 2007 for issuing the Final Rule. ***The Joint Parties do not want to delay or slow down the decision making process, so we ask that DOE take whatever approach that will meet or beat the September 2007 deadline.***

We look forward to a Final Rule that will save energy and money, while reducing environmental impacts.

Thank you for your consideration.

Respectfully,



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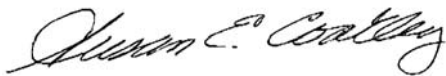
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