

Comparison of Trial Standard Levels for Low-Voltage Dry-Type Transformers

	Relationship to NEMA Premium (NP)	Energy Savings (quads)	Cumulative NPV		% of Purchasers Benefitting for DL6/7/8	Manufacturer Impacts – Industry Value NPV	Steel Generally Used ¹	Construction
			3% DR	7% DR				
TSL 1	NP for DL8, below NP for DL7 which represents 72% of kVA sales	1.09 quads but this assumes substantial purchases at higher efficiency levels ²	\$7.81 billion	\$2.03 billion	0/98/95%	-7.7 to +7.7% change	M6 or M5	Butt lap
TSL 1 with analysis revisions ³	No change from row above	0.75-0.80 without assuming substantial sales above standard	Substantially lower than row above	Substantially lower than row above	Probably lower than row above	No major change from row above	No change from row above	No change from row above
TSL 2	This is TP-1. NEMA supported as standard at end of RegNeg	1.12 [we estimate ~1.0 using same approach as row above]	\$7.79 billion	\$1.97 billion	28/98/95%	-8.9 to +6.8% change	M6, M5, M4 or M3	Butt lap for DL7; unclear for DL8
TSL 3	Above TP-1	1.29	\$8.51 billion	\$2.03 billion	82/98/85%	-12.2 to +9.1% change	M4 or M3	Butt-lap for single phase, full miter for 3 phase

Note: DL = design line.

S. Nadel, ACEEE, 2/19/13

¹ The lower the number the higher the grade.

² This is unlikely. As DOE notes, “The customer base rarely purchases on efficiency and is very first-cost conscious” TSD p. 12-47.

³ Assessment by ACEEE of the impacts of TSL 1 without assuming substantial sales above the standard.

DOE Interviews with Small Businesses

- DOE identified 30 manufacturers – 4 large, 12 smaller but not “small businesses”, 14 “small businesses” (‘smaller’ were either foreign or divisions of larger companies)
- Could reach and interview 6 “small businesses”. Of these, 4/6 produce some transformers in the U.S.; however the majority of volume produced by these six is produced outside the country.
- 3/6 have in-house mitring or wound core capability
- 3/6 firms now source some cores (20%, 100% and varies depending on pricing)
- 4 firms reported capital and one-time R&D investments of \$0-1.6 million per firm for a standard based on TP-1. Other 2 didn’t know.

Key Quotes from DOE:

“DOE estimates approximately 80 percent of the market is served by imports, mostly from Canada and Mexico. Many of the small businesses that compete in the low-voltage dry-type market produce specialized transformers that are exempted from standards. Roughly 50 percent of the market by revenue is exempted from DOE standards.” NOPR TSD p. 12-47

“In the DOE-covered low-voltage dry-type market, low-volume manufacturers typically do not compete directly with large manufacturers using business models similar to those of their bigger rivals because scale disadvantages in purchasing and production are usually too great a barrier in this portion of the market. NOPR TSD p. 12-48.

“In terms of market focus, many small firms simply compete entirely in the DOE-exempted markets.” NOPR TSD p. 12-48.

“Of those that do compete in the DOE-covered market, a few small businesses reported a focus on the high end of the market, often selling NEMA Premium or better transformers as retrofit opportunities.” NOPR TSD p. 12-48.

“At the same time, however, those small manufacturers may be able to source their cores – and many are doing so to a significant extent currently – which could mitigate impacts.” 77 FR 7365.

“[Small manufacturer] statements about their potential responses [to stronger standards] did not really change with CSL2 to CSL3 to CSL4.” [These correspond to approximately TSL 1, 2 and 3 respectively.] From DOE, “Small Business Impacts in the Low Voltage Dry Type Distribution Transformer Industry.”

Conclusion

- Substantial energy and financial benefits from TSL 3. DOE’s NOPR analysis understates benefits of going from TSL 1 to TSL3.
- TSL 3 can be met with M3 and M4 silicon steel, providing increased market for these steels.
- Few small businesses compete in the DOE LVDT market and some already emphasize high efficiency. Those who don’t can source cores or acquire mitring capability. According to DOE’s small business survey, producing NEMA Premium level transformers will cost from \$0-\$1.6 million per small manufacturer.
- It makes no sense to increase costs to purchasers by \$100’s of millions to save a few small manufacturers \$0-1.6 million.