

NEMA 2020 Strategic Initiative Report

Standby Power Regulatory Strategies

SI Brief Description: This SI was tasked with investigation into existing standby power (to include network standby) regulations and emerging regulatory efforts in effort to develop industry guidance for regulators about the standby power requirements of connected devices that offer edge computing, cybersecurity protection, monitoring, and other always-on functionality.

Background: There is a risk when focusing on individual component level performance (as most regulatory schemes are oriented) to set unreasonable expectations for the level of standby power allowed for connected products. As NEMA Members (and other industries) develop more IoT systems that include intelligent edge computing systems and cybersecurity protections, the power requirements to support these connected systems and their services may increase. There are concerns that regulatory bodies will stifle innovation and strand Member investments to develop these technologies through overly-restrictive standby power allowances. NEMA investigated how to take a leadership role in developing recommendations and Standards to prevent regulatory measures that strand these investments and make it difficult to manufacture connected devices with the features and security that customers want.

Deliverables:* the SI was tasked with investigating and making a list of existing test procedures for standby power energy consumption, examining those test procedures and standards for NEMA Standards work opportunities, cataloguing the regulatory bodies exhibiting interest or making efforts to examine or establish standby power regulatory limits, to develop advocacy strategies to engage those regulators as necessary, and to develop supporting materials for those advocacy efforts.

Outcome: The NEMA working group for this SI developed four primary documents. The first is a detailed list of known standby Power test procedures. Second, a gap analysis of those test procedures for areas where NEMA might develop Standards. Third, a list of known regulatory bodies interested in standby power. And fourth, an analytical review of those regulatory bodies and tailored advocacy recommendations.

Further deliverables were postponed, as regulatory interest in standby and network power consumption waned in mid-2020 due to the distraction of the COVID pandemic, and also likely due to previous advocacy efforts by NEMA and other associations which urged caution against prohibiting regulated devices from participating in emerging and still-evolving network environments. Additionally, there were no voluntary regulatory actions identified, where NEMA might have proposed regulations.

Conclusion: The materials developed by the SI will serve as useful references until such time as regulatory interest picks up, and they may inform future NEMA Standards development and advocacy efforts as well. There are times when proactive proposals for regulation are appropriate and the deliverables of this SI can serve that purpose if the subject is standby/network power.

* The aforementioned four deliverable documents follow this summary page.

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List of Known Standby Power Mode Test Procedures (Global sources. Devices vary.)

Product	Test Procedure
Networked edge equipment	EN50643:2018
Networked interconnecting equipment & Small Network Equipment	ETSI EN 303 423 (cites IEEE 802.11, among others) ANSI/CTA-2049 EU Broadband Code of Conduct EU's Complex Set Top Boxes voluntary agreement Energy Star product specification for Small Network Equipment, V1.0 IEC 62301:2011 (Household electrical appliances)* (EU Version is EN 50564:2011)
Lighting equipment	IEC 63103 (Expected 2020)
Audio-visual (AV) Equipment	IEC 62087
Imaging Equipment	Energy Star product specification for Imaging Equipment, V2.0
Smart Thermostats	Energy Star product specification for Connected Thermostat Products, V1.0
Telephones	Energy Star product specification for Telephony, V3.0 (Cites 802.3 and 802.11)
Telecommunications Equipment and Networks	IEEE 802.11-2012: Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
IT Routing and Communications Equipment	IEEE 802.3az-2010: IT Equipment: Carrier Sense Multiple Access with Collision Detection Access Method and Physical Layer Specifications
US DoE EPS Test Procedure	10 CFR Parts 429.37 : EPS and includes POE, 10 CFR Part 430 Appendix AA to Subpart B
NEMA/ANSI C82.16, LED Drivers	Emerging
NEMA White Paper LSD-82, LED Drivers Standby Power Measurement	Cites C82.16, emerging
IEA 4E Electronic Devices and Network Annex (EDNA) Network Standby Test Procedures	Annex B2 , cites 802.3, 802.11, and 62301 along with document-specific test method requirements
NEMA Standard WD-9	A primary document, with no normative references and its own test method. Includes labeling guidance. Not referenced by any known regulation.
Worth Mentioning	
EDNA Total Energy Model (TEM)	Total Energy Model (TEM) Annex A2
EDNA Network Zero (Testing cites Annex B2)	Network Standby Power Gaps and Opportunities Annex (Zero Standby Power) Annex B1

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EU Commission Regs 1275/2008 of 12/17/2008 and 2019/2020 of 10/01/2019	Both cite IEC 62301
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* IEC 62301 is for household electrical appliances but is likely the most frequently referenced in proposed regulations and other test procedures owing to it being one of the earliest and perhaps simplest tests. Its simplicity and frequency of citation in no way should imply that it is superior and widely applicable, it is simply all there was to cite. It is arguably mis-applied in some or all non-household appliance tests.

TP list last updated: September 14, 2020

Gap Analysis of Known Standby Power Mode Test Procedures for NEMA Member Scope Products

The value of NEMA Standards with respect to their ability to influence outside entities, in this case regulators, with regard to technical requirements for products was investigated by the SI to review and recommend, as appropriate, development of NEMA Standards to either advocate proactively or keep in reserve in case needed.

Lighting Division Products (Division 02, all Sections): The Lighting sector is an early involvement area, having already addressed standby power and connected power requirements in several regulatory arenas. This does not mean work is complete, or that future provisions are not possible. Likewise, work is being done internal to NEMA or externally with NEMA Member involvement. Examples include ANSI Standard C82.16 and the NEMA White Paper which references it, and work on IEC 63103 (led by a NEMA Member). (*Note that NEMA is the Secretariat for ANSI C82.)

At this time no additional test methods or other provisions have been identified as strategically of importance, however this is reviewed routinely and will be addressed as appropriate moving forward. As ANSI C82 emerges and more testing is conducted, the data gathered and analytical observations therefrom will be examined for regulatory potential.

Wiring Devices (05WD): Discussion with 05WD staff noted there was one Standard written for wiring devices a few years ago, WD-9, that dealt with standby power measurements. This standard applies to dimmers, photoelectric controls and other sensors, but is not referenced in any regulation. It was written for strategic use in an anticipated Mexican NOM that was never finished. WD-9 was added to the list of known Standby Power Test Procedures developed for this Strategic Initiative. No other standby power Standards were identified for this product sector and no gaps were identified otherwise.

Electric Vehicle Supply Equipment (05EV): A review of applicable ENERGY STAR specifications notes the presence of Standby Power requirements in the test methods. A review of gaps with NEMA 05EV Section Technical staff confirms no additional test procedures are needed or evident, as the ENERGY STAR Specification for EV Charging Systems addresses all known opportunities/needs.

Industrial Automation (01IS): A review with 01IS representatives and technical staff was made and no known gaps or Standards needs regarding standby power were evident.

No other NEMA Product Sectors were identified for further investigation by the SI working group at this time. (September 2020)

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List of Global Regulatory Bodies Expressing Interest in Standby Power

Regulatory Body	Evidence of Interest
U.S. Department of Energy	Standby and Connected Power is contained in some test procedures (TP), using TPs evidenced in companion NEMA document. The approach varies, either a set wattage is allowed for connected products (typical) or the performance curve grants additional leeway to connected products (DOE LED Lamps TP)
EPA ENERGY STAR (Quasi-Regulatory)	In various product specifications. TPs cited are listed in NEMA companion document ¹ . Note that Smart Home Energy Monitoring Systems spec has no standby power requirements in itself but references other E* product-specific specs instead.
California Energy Commission	Individual product requirements contain some requirements. Proceeding docket 17-AAER-12 contains relevant references of those TPs used or known by CEC. (Copied and expanded in NEMA companion document.)
International Energy Agency (IEA) 4E (Energy Efficient End-use Equipment)	Addressing MANY product energy efficiency issues, predominantly in EU though it is an International group. Standby Power is part of recurrent IEA 4E proceedings. No major movement or public discussion since meetings Stockholm SE 11/2018.
IEA 4E Connected Device Alliance	Provides recommended voluntary performance parameters, does not set requirements or regulation. NEMA was tangentially involved through siblings CTA and ITI.
CDA Voluntary Principles for Energy Efficient Connected Devices	Part of IEA 4E CDA's work. Can be found here .
IEA 4E SSL Annex	https://ssl.iea-4e.org/
IEA 4E Standby Power and Other Info	Useful links https://www.iea-4e.org/energy-efficiency-iniatives/links/standby-power
IEA 4E "Tasks" list, inc. Standby Power	https://edna.iea-4e.org/tasks
Natural Resources Canada	NRCan harmonizes with U.S. DOE Regulations and, sometimes, EPA Energy Star. Currently there are no known un-harmonized Canada-only regulations for Standby Power.
European Commission (EUC)	Two notable regulations; No 1275/2008 of 12/17/2008 and Commission Regulation (EU) 2019/2020 of 10/01/2019, both broad in scope. .

Last Updated: April 8, 2020

¹ "List of known Standby Power TPs"; NEMA Standby Power SI Document

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Advocacy Review of Global Regulatory Bodies Expressing Interest in Standby Power

Below, each regulatory body is reviewed and assessed as to the likelihood and potential timing of future standby and connected power regulatory proceedings with recommendations whether, when and what to advocate before them.

U.S. Department of Energy:

Existing Activity: Several existing Federal test procedures and product minimum energy conservation Standards already contain Standby Power requirements or other provisions.

Potential Impacts: At this time, none of the emerging potential Energy Conservation Standards contain significant mention or negative impacts towards Standby Power for NEMA scope products.

Strategic Value: The DOE is a potential ally in passing Standby Power requirements, if NEMA desires such, if first presented with an industry Standard to consider incorporating by reference. The DOE process is slow however, so is not useful when speed is important.

Recommendation: Until such time as a NEMA Standard, or other appropriate 3rd party Standard, is available and a Proceeding is underway or desired, NEMA should continue to participate in DOE Rulemaking milestone events but not advocate for further attention on Standby Power requirements.

EPA ENERGY STAR:

Existing Activity: Several E* Specifications contain provisions for Standby Power. At this time no new work on NEMA-scope programs is evident except for EV Charging.

Potential Impacts: For established programs, potential impact is thought to be low. For emerging programs like EV Charging, impacts might be more significant.

Strategic Value: EPA staff are generally receptive to NEMA recommendations, especially if accompanied by Standards and advocated 1:1 outside of public meetings. If NEMA has Standards or other Standby Power messaging for products inside E* scope, advocacy before EPA staff could be valuable to carrying the NEMA position forward. Furthermore, EPA staff or consultants have a few times in the past participated on NEMA Standards development working groups, which greatly improves the chance of importation of the NEMA provisions as-published.

Recommendation: Continue the current staffing and advocacy practices unless or until specific issues are identified, at which time more focused advocacy would become appropriate. The EV Charging advocacy and NEMA consensus work should continue, and routinely the NEMA 05EV Section should reconsider whether any NEMA Standards opportunities have risen (though none are currently identified).

California Energy Commission (CEC):

Existing Activity: There is an open Docket in the Title 20 sector for a Roadmapping of Low Power Mode (Standby Power). There has been no appreciable movement however for over a year.

Potential Impacts: Because CEC can be very aggressive in scope and goals/requirements, potential impact is high.

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Strategic Value: CEC's enthusiasm means they move faster than most regulators, especially when given clear data-driven proposals. If NEMA identifies energy savings related to Standby Power and can identify accurate, repeatable test methods, it may be worth petitioning CEC to undertake a rulemaking.

Recommendation: If a NEMA product class is identified as having notable energy saving potential related to standby power, or notable risk with regards to overly-restrictive standby power requirements, CEC can be a useful ally if NEMA can influence the narrative by delivering a clear, data-driven proposal. CEC is not a good avenue for exploratory work, as they have a bias towards action with respect to publishing regulations whether manufacturers agree or not.

International Energy Agency (IEA):

Existing Activity: IEA EDNA 4E work has been ongoing, and an existing Annex is being revised or a new Annex developed a few times a year.

Potential Impacts: IEA is looked to by various advocacies for examples to copy or promote, both inside the EU and beyond. Their ability to influence North American regulations cannot be ignored.

Strategic Value: IEA are always interested to hear about new Standards or proposals, but sometimes come across as dismissive of U.S. industry comments. In practice, they seem to prefer their own work, versus acting on outside proposals, and their staff working models are very relationship-dependent. The lack of in-person NEMA European advocacy presence makes it difficult to influence IEA/EUC work, regardless of the merit of the NEMA position. They will review NEMA Standards and other proposals, if provided them, but one cannot say with certainty how much content might become incorporated later.

Recommendation: Continue to closely monitor the IEA 4E Annexes for their contents and potential strategic value. Contribute as able to comment periods, understanding that little weight is given to U.S. industry proposals (i.e. do not invest significant time/resources).

Natural Resources Canada (NRC):

Existing Activity: None known. There are no active Amendments in progress that might revise or establish regulations in the NEMA product scope.

Potential Impacts: Low. NRC tends to copy/align with U.S. DOE regulations. Proposals should be closely reviewed for technical and timing accuracy of the copied/aligned statutory passages.

Strategic Value: Low. NRC tend to react to existing regulations rather than create new regulations and their publication and review process is very slow also. They are not a good body to advocate new requirements to.

Recommendation: Review and comment to NRC proposed amendments as already practiced. No special action is needed/recommended.

European Commission (EUC):

Existing Activity: No active new "Lots" of products at this time.

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Potential Impacts: Low, unless a new Lot is created, or an existing Lot is opened for revisions with NEMA Member products in scope. The greatest potential impact is perhaps for those products where a NEMA Member currently sells the same product in the EU and North America (potential market fragmentation / barrier to trade).

Strategic Value: As noted under the IEA entry, the EUC staff model relies heavily on personal relationships and physical 1:1. The lack of in-person NEMA Advocacy presence in the EU puts us at a disadvantage there.

Recommendation: Continue to monitor EU activities and routinely reach out to NEMA Member companies with EU counterparts to ask for updates/news. It may also be worth developing a relationship with the German association ZVEI², who represent the German Electrical Manufacturing Industry. No proactive regulatory advocacy is necessary at this time.

End of Document

² <https://www.zvei.org>