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## **The Green Grid Response to ENERGY STAR® Draft Certification and Verification Requirements (June 2010)**

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The Green Grid Association, a consortium of industry-leading companies, welcomes the opportunity to comment on topics under consideration for the ENERGY STAR for Computer Servers specification.

## Introduction

A consortium of information technology providers, consumers, and other stakeholders, The Green Grid seeks to improve the energy efficiency of data centers around the globe. The association takes a holistic and comprehensive approach to data center efficiency and understands that ensuring the data integrity of the ENERGY STAR program and qualified products is critical to advocating the adoption of energy efficient equipment. Participants in The Green Grid include such diverse companies as major server and storage equipment manufacturers, major software providers, and large data center end users/owners.

## Summary

The Green Grid understands the sense of urgency EPA brings to their update the qualification and verification procedures in the ENERGY STAR® program in light of the GAO report released earlier this year. TGG appreciates the opportunity to review and advise on the proposals provided. TGG recommendations reflect its members' experience in the development, manufacture, procurement and use of enterprise and data center equipment.

The GAO report highlighted several aspects of the qualification and compliance verification process for ENERGY STAR products that require enhancement. The computer industry already has many standards and procedures established in their in-house labs to generate accurate data to demonstrate compliance to product requirements and populate datasheets mandated by regulations such as FCC regulations and EMC. Manufacturing standards such as ISO 900x establish repeatable, documented processes and procedure for manufacturing, laboratory and data quality which enable continuous compliance to the specifications the product has been designed and qualified to. Where errors, faults, and changes occur during the manufacturing life of the product, the ISO procedures provide detection and remedial procedures to address identified discrepancies. For laboratory operations, ISO 17025 institutes lab and test policy, procedures, and practices that ensure data integrity and the consistent execution of laboratory procedures to ensure the reliability and independence of the lab operations. ISO 17025 provides a robust, internationally recognized standard to generate accurate data and provide the quality control needed to provide the data integrity required by the ENERGY STAR program. Therefore, adopting and utilizing existing ISO standards, without modifications, should address the GAO's highlighted concerns. In particular, ISO standards already provide for data integrity in addition to dictating test and data reporting processes and procedures from manufacturer's (in-house) facilities. The enhancement language in the EPA's proposal is unnecessary and in conflict with these practices. As a result, we recommend that the EPA avoid altering these international standards.

Adoption of rigorous standards such as ISO standard(s) that govern the product qualification and verification program and product certification requirements creates serial dependencies in the implementation of the lab processes. The required lab process updates necessitate a longer implementation schedule than that currently envisioned by EPA. Application of the ISO standards to the ENERGY STAR program parameters will take time to:

- Update and refine the testing and documentation requirements
- Train and establish auditors and/or accreditation bodies (AB) on the ENERGY STAR program data specifics and product application details
- Test sites to collect and organize data in support of the auditing procedures

- Apply and schedule audits
- Conduct the audits (of multiple sites)
- Address remedial concerns
- Data review and granting of the certification

Based on the certification structure and processes, we've outlined a schedule that highlights the duration and critical milestones of what the process may look like (interpretation of the ENERGY STAR proposal):

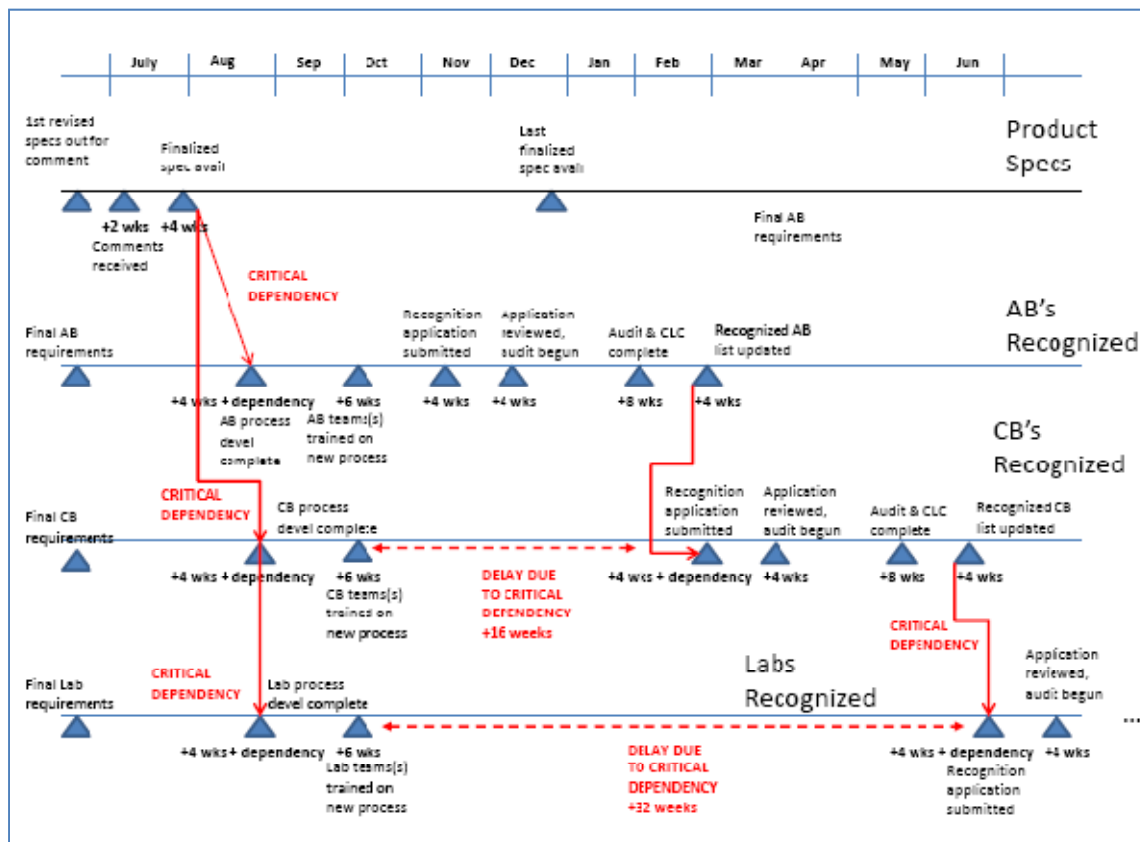


Figure 1. Test Facility Certification timeline/schedule

As indicated by the schedule outline, the IT industry believes that 12-18 months after the qualification and verification procedures are finalized will be required to have labs accredited and trained for the targeted ICT products. It should be noted that some products, such as servers and storage equipment, have just or will shortly be entering the program and there is limited experience with the current testing procedures. All of that experience is at in-house labs. This experience is different from other products, such as white goods which have a longer history with ENERGY STAR testing procedures. The schedule also assumes finalization of the product specifications, confirmation of test configurations, product configurations, and documentation.

The ISO accreditation offers extensive review and detail to ensure reporting accuracy. The proposal to require the certification body to provide an additional certification of the qualification data is redundant, costly, and would increase the amount of time to get ENERGY STAR rating on products. The increased time to complete the redundant quality checks are likely to extend beyond product introduction cycles that products if the company wishes to have an ENERGY

STAR rating at product introduction or delay the announcement well after product announce which would not benefit consumers, the ENERGY STAR program, or the product manufacturers.

For surveillance and continued compliance verification, sampling custom configured systems is difficult, costly and not practical. Most enterprise systems are custom configured and integrated on site to the data center computing, storage, or network fabric. The requirement for Product Specification Audits (3.b), where the CB should maintain product design specifications and conduct random manufacturing specifications, is overly burdensome and unnecessary. These requirements are fulfilled by companies through their design and quality process, which are typically governed by ISO 900x standards. In line monitors and quality procedures in an ISO 900x facility provide the vehicle to monitor conformance with product specifications and detect material changes that may impact specification compliance. Data monitors and change order documentation reuses the quality controls in these manufacturing facilities without the need for additional verifications by means of random samples or data certifications. The verification process provides the necessary random sampling to validate the robustness of the OEMs processes.

Therefore, for data center ICT equipment and an enhanced ENERGY STAR certification and verification program, TGG recommends:

- Use ISO accreditation standards without amendments or modifications
- Allow 12-18months to transition to the new process accounting for accreditation procedures and training
- Utilize the standards to accredit and certify the facility and test process. Re-certification of the data is redundant, costly, unnecessary and should be avoided.
- In-line data monitors and documented change control offer an accurate, more reliable assurance of continued compliance
  - o We recommend that the verification process and procedures be determined in the ENERGY STAR specifications for that product group. The requirements for the verification program testing should be incorporated as a specific set of criteria in the ENERGY STAR product requirements. This will enable the EPA to accommodate the subtleties of verification testing for different product types and flexibility to enable a cost effective, robust verification process. Where product sample testing is required for the verification process recommend the following steps:
    - o The CB will need to order equipment and send the equipment order to the testing lab. That is the fulfillment method used widely across our industry. EPA needs to add an ordering option to section 3.a.i.4.a.
    - o The CB should procure minimally configured products (as defined on the data sheet) to minimize procurement costs, simplify system set-up and configuration and reduce shipping costs.
    - o As recommended in our previous comments, the CB should consult a company's product sales data and select the product for verification from the top 5 or 10 configurations of the model where a product family has been submitted as a qualified product.
    - o The requirement to "witness" the production of the product at the manufacturing facility should be removed or excluded from ICT equipment. The proof of the integrity of the system is provided by the verification testing.

## **Additional Comments Per Topic**

### **Accreditation and Certification Bodies**

The *requirements of CB* draft appears to allow use of certified in-house test labs but requires all tests to also be certified by a CB. This is an additional layer of bureaucracy which increases costs and delays in the program. If employing standards such as the ISO series, the certification should be focused on the facility and process. The additional detailed comments seem to amend and augment the existing requirements. The changes also causes conflicts in interpretation, such that even ISO compliant facilities may not be able to comply. We recommend that ENERGY STAR program adopt the ISO standards without modifications and use them to certify the facilities as opposed to additionally certifying each test. The ISO standards allow for in-house testing while ensuring data and process integrity.

### **ENERGY STAR Compliance Monitoring**

Section 3ai2a and 3bi call for CB's to re-test final product in addition to performing random audits of the manufacturing facilities. These are redundant and extreme. Given the custom configurations and on-site integration processes on enterprise systems, sampling "final" product is problematic without a target operation. Document audits should be sufficient for a certified lab or manufacturing site. On-site audits can be limited only to ensure continued compliance.

### **PRODUCT QUALIFICATION**

The requirement that the CB receive an attestation for each product qualified to the ENERGY STAR standard is redundant and unnecessary as partners commit to label their products in accordance with the ENERGY STAR requirements when the partner agreement is signed. If EPA wants a periodic re-commitment to the ENERGY STAR requirements by its partners, then it should require that a partner resubmit an updated partner agreement each year to update contacts and reconfirm the partners commitment to the program.

EPA should require that the CB submit newly approved qualified products to EPA within 3 business days of verification of the qualification.

### **Data Center Infrastructure Considerations**

Though the bulk of this document deals specifically with IT equipment the issue of independent testing and verification is equally important to those who manufacture infrastructure equipment and systems for data centers. It is our understanding that the vast majority of the UPS industry manufacturers currently providing products to the data center community, who may be interested in pursuing the ENERGY STAR rating, already have in-house test equipment, ISO procedures, third-party verification of test equipment calibration, and frequent test oversight and verification by third-party labs, consulting engineers, and large end-user customers.

In addition many of the UPS units supplied to the data center industry are physically large, heavy, available in numerous configurations, have extensive set-up requirements, require extensive support equipment including DC plants to simulate batteries under various states of charge, precision programmable load-banks, switch-gear, and a host of system-level skilled technicians to ensure smooth operation of the test program. Often, due to system-level complexity and customer/consulting engineer requirements, the test process may take three to five business days with the off-hours used for system stabilization.

Therefore we encourage the EPA to consider alternate solutions to address compliance and verification testing. It is our recommendation that we explore this subject together with the manufacturers, large end-users, and consulting engineering firms as part of developing the formal ENERGY STAR for UPS specification and other data center infrastructure components and systems as they become eligible for ENERGY STAR.

### **Management of Product Certification Process**

EPA Needs to Establish Service Level Requirements in its Contracts with the Product Certification Bodies:

- Specify Time to Review and Respond to Manufacturer's Submissions
- Provide Clear Description of Requirements for Submitting Data
- Establish a Dispute Resolution Process

The Requirements to Review Manufacturing Facilities is Unreasonable. Requirement should be ISO 900X Manufacturing Certification, which in turn should insure product meets specific requirements. Documentation reviews covering any material change orders or quality monitors in manufacturing should be sufficient to ensure continued compliance.

### **Conclusion**

The Green Grid remains committed to a continued successful ENERGY STAR program for data center equipment. We believe a successful qualification and verification program takes into account the existing processes and procedures already deployed in the industry to insure manufacturing quality and the accuracy and integrity of testing performed to verify product conformance with various standards and requirements. TGG has provided a consensus opinion and recommendation from system developers, consumers, and industry specialists on computer products and data center equipment. We encourage the ENERGY STAR program to thoughtfully consider incorporating TGG recommendations to extend the implementation schedule for the revised testing and verification process based on the industry experience with sequential implementation of the requirements of established international standards. TGG recognizes EPA's urgency in implementing an improved process, but emphasizes that the implementation of standard processes take time if they are to be done properly. TGG offers to consult with EPA as to how the implementation process could be streamlined or on establishing specific, interim changes which could be implemented to enable improvement of the process while the more detailed standards processes are put in place. TGG highly recommends strict adoption of international standards, i.e. ISO, for data quality and accuracy assurances without amendments. We advise against establishing parallel or derivative standards, as these create a duplicative procedures, increase manufacturing and administrative costs, restricts participation in the ENERGY STAR program, and conflicts with internationally recognized procedures. We advise and offer industry support to adopt and integrate the appropriate international standards into the ENERGY STAR program. We believe this utilizes the industry's standards experience and enhances the accuracy and supervision of the ENERGY STAR program. Please feel free to contact us to clarify and collaborate on the development of the specifications and the implementation of the program.