

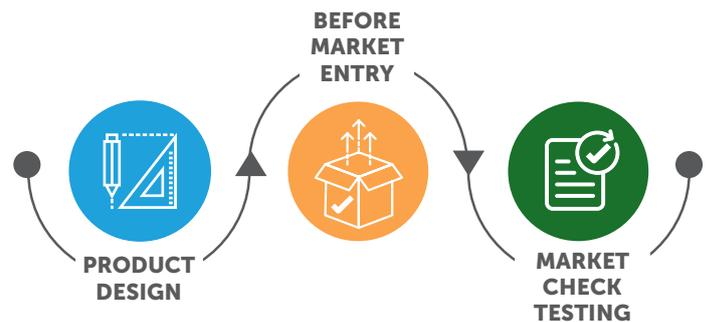
The Role of Testing in Off-Grid Solar Product National Standards Programs

Testing products is fundamental to creating and implementing policies for off-grid solar products, and is essential to guaranteeing the quality and efficacy of products on the market. Testing enables governments and other stakeholders to accurately verify product performance and quality, and to ensure compliance with set standards at the three key stages in the product life cycle: 1) at **point of design**; 2) **before entering the market**; and 3) once **on the market**.

Testing at **point of design** is typically less rigorous, serving as a mechanism for manufacturers to check performance of their products to improve the design or quality and to determine whether they can meet applicable design standards. The results are not used to prove compliance, but they serve as an informative step in the design process. Manufacturers may choose to test a product in an accredited or non-accredited lab.

More rigorous testing is required before entering the market and once on the market. **Before entering the market**, businesses need to certify that their products meet the Lighting Global and/or national standards. These test results serve as robust evidence to prove products meet the standards and therefore can be legally supplied and sold. When conducting market surveillance for products **on the market**, initial tests may be less robust to help screen and target non-compliant products and therefore can be carried out in non-accredited laboratories.

WHEN ARE PRODUCTS TESTED?



However, follow-up verification testing must provide concrete evidence that a product is non-compliant and must be removed from the market and therefore must be done according to national, regional, or international test methods by test laboratories that have obtained ISO 17025 accreditation to those methods.

Policymakers must decide where and how to test for off-grid solar product standards, specifically, whether to use existing test laboratories from the Lighting Global Test Lab Network, or whether to invest in a new national laboratory. In doing so, policymakers must carefully consider their needs, objectives, available resources, procurement policies, legal requirements, and other variables. Testing is time consuming, and it is therefore important to consider where and when to conduct tests in order to avoid disrupting the flow of goods in the supply chain. Moreover, testing programs and laboratories demand significant physical and human capacity. Sharing resources or utilizing existing laboratory facilities and experience across countries can significantly reduce program costs.

LIGHTING GLOBAL QUALITY ASSURANCE—TEST LABORATORY NETWORK

Test laboratories qualified and trained by the LG QA program



THE BEST PRACTICE CASE FOR USING RESULTS FROM ACCREDITED TEST LABORATORIES

The most efficient, cost-effective, and least burdensome approach to testing is for national standards programs to accept test reports from accredited test laboratories around the world, including laboratories in the Lighting Global Quality Assurance (LG QA) verification process. Benefits of using existing accredited testing facilities include:

- Standards can be implemented without delays with no need to build or invest in national testing facilities, allowing government funding to be directed to other priority areas that support standards implementation.
- Existing accredited laboratories are qualified and prepared to carry out the test methods and produce accurate reports. They can quickly test a greater volume of products, speeding up entry of qualified products to market.
- Testing that occurs close to the point of manufacturing and prior to product shipment enables efficient delivery of products to market. Qualification testing for off-grid solar products typically takes 2-4 months, and it is disruptive to carry out testing when products reach the port of entry.
- Burden on government is reduced when businesses submit their products for third-party testing or use the LG QA verification process. Harmonized quality standards enable businesses to test their products once in existing accredited

test laboratories. The results can be used to qualify products for entry in multiple markets.

- Instead of investing in new testing capabilities, policymakers can allow institutions to bid on national testing projects. Competitive bidding among providers of laboratory services incentivizes them to provide lower prices for testing services, which in turn reduces costs for the national government. Additionally, specifying requirements for testing laboratory accreditation in the tender document may improve testing quality.

WHEN TO INVEST IN NATIONAL GOVERNMENT-RUN TEST LABORATORIES

In addition to using existing accredited test laboratories, governments may choose to invest in and build national government-run facilities. When developing standards programs for off-grid solar products, policymakers must consider very carefully whether there is a business and market need for a national government-run test laboratory. Establishing and maintaining a national testing laboratory can be logistically, administratively, and financially challenging.

Developing testing capacity for off-grid solar products requires significant initial investments in construction, equipment, and human resources, especially where no testing capability has existed previously. A long-term financial commitment is also necessary to support the operation and

maintenance of testing laboratories. The long-term budget required may fluctuate, especially when new products and test methods are introduced and implemented. The budget must provide sufficient funding for ongoing operations, management, accreditation, and training.

If a national testing facility has been justified and sufficient resources are secured, a significant time investment is still required to establish a new testing facility and to train staff so they are qualified and confident with the testing equipment and methods. Setting up a laboratory can take six to twelve months or more, after which the laboratory can seek accreditation, which can itself be a lengthy process. All of this must be complete before a laboratory can begin official product testing, which can significantly delay the standards implementation process, unless results from internationally accredited labs are also accepted. Additionally, on-going building and equipment maintenance and instrument calibration, as well as the certification, training, and retention of technical staff, require regular investment. Intermittent or part-time operation of a testing laboratory is impractical. Without a continuous stream of business, the costs to run and maintain a test laboratory will be high and the investment costs cannot be recouped.

Establishing a national testing laboratory is an easier investment to justify when a large domestic off-grid solar product market and significant manufacturing base exists, as the scale of the local market creates a high demand for in-country testing. Even then, if commercial or research testing laboratories exist in country, it may make more sense for the government to contract with these laboratories to conduct testing on its behalf. In countries where there is a small, or no, domestic manufacturing base and most off-grid solar products are imported, it is more cost effective to rely on the accredited testing facilities such as those in the Lighting Global Test Laboratory Network.

HOW CAN THE LIGHTING GLOBAL QUALITY ASSURANCE PROGRAM HELP?

At its core, LG QA offers impartial third-party assessment of off-grid solar products, provides buyers with reliable technical information, and connects them with manufacturers and sellers of quality-verified products. LG QA can support the implementation of standards and testing for governments in several ways:

- The program coordinates the testing and verification of product quality and performance, which governments can use for certification of products onto their market. This can help alleviate the burden of upfront testing and market check testing by national inspection and enforcement agencies.
- LG QA provides training and technical support to test laboratories looking to join the Lighting Global test laboratory network. The program maintains strict standards for the network and conducts periodic inter-laboratory comparison testing to ensure the ongoing quality of each participating test laboratory. Test laboratories that conduct qualification testing for Lighting Global have ISO 17025 accreditation to carry out the relevant tests for the respective off-grid solar products.

Lighting Global's quality assurance work is coordinated from the Schatz Energy Research Center, Humboldt University in Arcata, California. The global network of laboratories is located to be in close proximity of manufacturers and consumers in key off-grid lighting markets across Africa and Asia. Lighting Global coordinates a network of sampling agents and laboratories to test off-grid lighting products across the supply chain, from the factory shipping floor to retail shelves.

Please visit www.LightingGlobal.org for more details on how to find or become an independent test laboratory capable of providing valid results for Lighting Global according to the IEC/TS 62257-9-5 test methods or Lighting Global Quality Assurance Protocols for Solar Home System Kits.