Draft Minimum Quality Standards for Solar Home System Kits Webinar Notes

September 17, 2014

OVERVIEW:

Below are notes from the Lighting Global Quality Assurance webinar hosted on September 17, 2014. The QA team described the plans to cover solar home system kits under the Lighting Global QA framework, a summary of the recent stakeholder process on the Draft Minimum Quality Standards for solar home system (SHS) kits and the next steps in developing the program.

PRESENTERS:

Dr. Arne Jacobson, Technical Lead for Quality Assurance at Lighting Global (Director of the Schatz Energy Research Center at Humboldt State University)

Meg Harper, Engineer for Quality Assurance at Lighting Global (Research Engineer at the Schatz Energy Research Center at Humboldt State University)

Hans Peter Birkhofer, Technical Director for the Global Off-Grid Lighting Association (GOGLA)

PARTICIPANTS:

There were 38 participants from the public.

PRESENTATION OF WEBINAR SLIDES:

Most of the information presented during the webinar was included on the slides. The webinar can be viewed on You Tube (http://youtu.be/upLHpn4wbow) and the slides can be downloaded from the Lighting Global Stakeholder webpage (http://www.lightingglobal.org/activities/qa/stakeholder-engagement).

In brief:

- Arne Jacobson introduced the webinar logistics, introduced the speakers and gave an overview of the Lighting Global Quality Assurance program.
- Hans Peter Birkhofer introduced himself and GOGLA, encouraged engagement with the stakeholder engagement process and described the rationale for expanding Lighting Global to solar home systems kits.
- Arne described Lighting Global's planned approach for expanding to solar home system kits and then took questions.
- Meg Harper described the stakeholder process so far, the compiled comments and responses in a stakeholder feedback document and the process to incorporate comments into the minimum quality standards. Meg then outlined one particular item of feedback, that of the upper limit for SHS kits. Questions were then taken.

- Meg described how feedback leads to changes in the draft minimum quality standards, the stakeholder feedback document available to download, and then talked about another key issue of the definition of plug and play kits. Questions were then taken.
- Meg discussed the issue of warranty and the feedback we received from stakeholders on it. Questions were then taken.
- Meg described the immediate next steps for developing test methods, continued research to be conducted, and long term next steps. Questions were then taken.

QUESTIONS AND ANSWERS:

QUESTION	ANSWER
I wanted to reiterate the point I submitted online already: What is the added value of this minimum quality standards? For picoPV, there was nothing. For SHS, there are standard requirements already.	There are requirements in place for components of solar home systems. We will draw from them heavily as we think about kits. There is not an existing QA framework out there that covers complete system evaluation of kits. The current effort is focused on using existing materials and adding to that a set of methods that is appropriate for testing at the system/kit level.
In the Energy Access Continuum PPT slide and in section 1.3.7 in stakeholder feedback it refers to the "energy access spectrum" from "pico-products" to "solar home systems" to "mini-grids". I'm compelled to point out the significant "blind spot" that is the GAP between SHS and mini-grids. Before jumping from SHS (for home markets) to mini-grids (for more AC power) one needs to recognize the great productive/enterprise potential for stand-alone PV systems. This includes water pumping for livestock, refrigeration in rural cafeterias, rural computer centers, etc… All language seems to refer to "homes" unless you go to mini-grid but this ignores productive PV (PPV). Please comment on your view.	There are a number of ways that solar technologies can be used for productive activities. Our program is not going to focus on that in the near term. We will focus on kit based systems – where complete packages / small scale applications apply.

QUESTION	ANSWER
May I suggest you consider the Hong Kong Science Park as a testing lab as they have facilities for solar, LED lighting and more all in one government supported campus at reasonable costs.	We are interested in engaging with labs that are interested in operating in this space. If there are interested test labs we have a policy that guides the test labs that we would be willing to engage with and accept test results from. Any lab that meets those requirements would be in a position to provide testing services. The primary requirements are that the lab needs to have ISO 17025 accreditation to provide testing services to the specific test methods we're using. These requirements are outlined on the Lighting Global website. If a lab is interested there is a process where they can submit their qualifications for review. Sample collection must still happen through our framework and the lab must work closely with us in terms of sharing test reports for our review.
Hello everyone, as a last-mile distributor, we at PowerMundo are curious if testing will be done once product has been used in the field to see how they hold up?	We do market check testing where we pull samples from market channels to make sure that what's being sold into the market matches the quality and performance of the product that was tested initially. We are very interested in seeing how products perform in the field. Several research efforts have informed our thinking and we have taken the results to advise our QA framework. We are always on the look out for information on the quality of products in the field. In some of the studies, we have been involved in conducting them and while others were provided to us.
Arne, thanks for the reply. However, how do you propose to draw the line between "component-based" systems and "kits". Would this not reduce flexibility for solar companies who adapt their offer to client requirements (e.g., using a different panel or battery, depending on current market prices and the specific customer's loads)?	This is one of the key questions we have to engage with, how we define what qualifies as a kit as well as what qualifies as plug and play. We do have a way of evaluating families of products within the current QA system and we expect to use that framework within the larger SHS kits. If a company has a series of complete packages we have a way of evaluating that family of products so that they can be qualified under our system. This policy is available on the Lighting Global website. We will be reviewing this and will be interested in getting feedback.
We have developed a product which is solar home light + mobile charger + water purifier. can you certify such product. this product truly addresses the requirements of rural and remote area which do not have access to drinking water & light	We would like to congratulate you and your company for development of this product. We expect and understand that SHS kits will have a variety of appliances that will be used with them. With pico solar products our focus has been on lighting and mobile phone charging. Once we move up to SHS kits the variety of appliances will expand greatly. The challenge is having a framework to evaluate the kits given that they will use a variety of appliances. We will not have specific test methods for evaluating the efficacy of water purifying but we will have a way of evaluating whether a kit will have the power to meet the energy requirements of the water purifier.

QUESTION	ANSWER
Is there any plan about country specific quality standards?	We are not looking to develop country-specific quality standards. We are looking to develop a framework that applies more broadly, globally across multiple markets. A strong element of our program is to have a framework that can be harmonized and used across multiple markets. Individual countries and organizations may be looking to develop quality standards that are country specific. We would encourage them to harmonize with this more global framework by adopting the standards and test methods we are developing and engage with us if there are country specific concerns or things that are not included in our framework.
Do you see this as really becoming a customer focused "stamp of quality", or primarily a requirement for some programs? Other than a third party verification, where do you see the biggest outward facing function of quality standard?	We primarily focused on providing verification and delivering that information to distributors, financial industry and other stakeholders that are a bit upstream in the supply chain. The listing of the spec sheets and verification letters fit that profile. We can have a significant impact on QA by focusing on that end. We recognize that there could be a benefit to also reaching end consumers and there have been some activities that have been consumer facing such as consumer awareness activities in particular countries. We have not developed a consumer facing quality seal. We recognize the value but there is a significant cost and risk to developing a seal and defending it from counterfeiting. The strategy we will use for SHS kits will be similar to what we have used for pico solar systems focusing more upstream in the supply chain. We will not rule out something more consumer facing in the future but it's not part of our immediate strategy.
Do you intend to extend testing beyond lights, into other appliances?	We do not have specific plans to do that at this point. We do intend to test the basic interoperability of appliances with kits, especially if they come with appliances. We do not intend to evaluate appliances themselves as a standalone certification, e.g. TVs. We will evaluate power consumption to ensure they meet truth in advertising.

QUESTION	ANSWER
What would drive the demand for such systems are DC appliances, such as LED TVs and DC Refrigerators. Our TV consumes only 7.6Wh, however, assuming an average power consumption of 10-20Wh, which an end user would want to watch for 2 hours, and SHS with lead acid battery with 50% DoD, you would need a SHS of 40-80Wh, so ~100Wh SHS seems like a suitable target if my calculations are correct. Please do correct me if I am wrong.	We are not working to make a determination of what sorts of products are likely to sell in the market. The private sector and consumers are better positioned to determined that. Initially we will focus on a 100W limit for practical purposes. If we see there is great demand for larger systems we will consider expanding the framework to match what is in the market.
For DC Refrigerators, that have to run several hours per day, if not 24/7, more than likely you would be looking at larger systems, I think, that would be out of the scope of what is being considered, i.e. 100Wh SHS or smaller.	Our initial focus is on systems that are smaller than 100W. If we see significant demand for packages above that, we will look carefully at that.
Is there an accelerated ageing component to the testing? (Especially batteries, of course)	We are still in the process of developing test methods. There will be some durability evaluations for batteries. In selecting those methods we have to strike a balance between the cost and time of completing that testing. We are looking carefully at this as batteries have historically been the weak link in systems. Battery durability is a critical issue. Battery durability testing through cycle testing is very challenging and expensive for testing in a program like this. On the pico solar side we have adopted a test that can be completed in about 6 weeks that does evaluate the durability of batteries and in particular the ability of batteries to withstand deep discharge. We will adopt a standard that is similar to this for the larger systems. At the same time it will be difficult for us to adopt long term cycle testing given the cost and amount of time.
how you choose the number of units to test? shipping cost to Germany or US of up to 16 SHS with 100Wp will be quite high	We recognize this. The approach we are using for evaluating the kits initially is using a sample size of 4 for each test. It's necessary to carry out a number of tests in parallel and some are destructive to the units so that they are not useable after the tests. To move through the initial set of tests we will need 16 samples (which includes spare samples). Following the initial round of SHS testing we will evaluate whether the number of units to test should change. We recognize the burden of shipping costs and providing the sample units. We will stick with this requirement for the initial round of testing but will review and may make adjustments.

QUESTION	ANSWER
I agree with less than 100W. For when you are in the market, most people can't afford more than 30W, if without financial support.	Thank you for your comment. We look forward to hearing more opinions on this subject as we develop the methods.
These are all very good points as to an upper limit. I don't see much of a difference between 100 and 120Wp and the natural amperage limitations will self-select. I would go for either or both 10A and 100Wp. Makes sense on technical and also the natural partition between plug and play and more complex systems.	Thank you for your comment. We look forward to hearing more opinions on this subject as we develop the methods.
It seems like it would be best to have flexibility in the maximum power or Amp rating for the program. Perhaps, the SHS supplier would need to specify what they expect their SHS to power, i.e. TV, Fridge, Water Purifier etc. and part of the testing could be to verify that the SHS is able to power the devices the supplier advises their product is expected to power (for the expected number of hours the devices are expected to be used).	Truth in advertising is a centrally important component and it makes sense for the supplier to define what it is their system is intended to do. This is a key element of the approach. There is a practical upper limit to the types of test methods to use and to the safety of what would be considered plug and play. We will evaluate the upper limit over time. We will start with the limit we have and see where the market takes us.
field replaceable batteries presents an issue for PAYG systems that attempt to protect the battery from tampering. Is this being considered?	PAYG systems are a type of system that we are looking carefully at and we see it as being a very promising delivery model for this space. We are expecting to cover them within the framework. There are some aspects of PAYG that create potential complications and we expect to do a fair bit of research over the coming 5-6 months to see how to include PAYG systems and the challenges of evaluating them. We feel that it is important for people to have their batteries be replaced over the life of the system. Our current thinking is that batteries should be field replaceable for these types of systems to ensure consumers are able to use them beyond when the PAYG systems have been paid off and beyond the life of the battery. We would be interested to engage with PAYG manufacturers or system integrators to think through these issues and how to address them to ensure end users should be able to have their batteries replaced multiple times over the life of the system.

QUESTION	ANSWER
What about roof / pole mounts for panels? Do they form part of the kit?	We need to think this through, similar to the issue of screw terminals. Installing a solar module on a roof or pole mount requires some basic tools and a technician is better positioned to do this. Permanently mounted modules will serve the system more effectively in most circumstances. We want to allow systems that do have these mounting systems within the framework. We expect the electrical connections to be plug and play but would allow tools to be used in the case of these sorts of mounting systems.
You indicate that instructions SHOULD be presented using language and graphics that can be understood by a typical consumer. Will this be a requirement or a recommendation? If required, how will you determine what is "understandable", especially considering the diversity of markets & consumers?	This is one of the major challenges of delivering these systems effectively in multiple markets – a reasonable way of presenting information so that it will be understandable to consumers across multiple languages. We have interesting and useable guidelines that help us think about this for example from the Bangladesh IDCOL program. We need to do additional research and are interested in input. We want to take a practical approach that addresses usability but also the practical side of operating effectively from a business perspective
So the systems would be advertised as plug-and-play, however maintenance would still be essential to these systems, which probably would not be able to be done by the consumer. Do you assume the market would provide this service?	Yes, in some way, either the company would provide after sales service for these systems or others in the market could be in a position to provide this service. Evaluation of after sales service is outside the bounds of the type of QA framework we are setting up. From a practical perspective it will be very difficult to evaluate the effective delivery of after sales service globally across all markets. This is the limitation of the type of QA we can provide through the type of framework we are looking at.
Will a kit have one guarantee period or different guarantee periods for its different components?	We are at the moment going to stick with the proposed warranty period of 3 years for the system and PV and 2 years for the battery.

QUESTION	ANSWER
Consider staying away from the term "plug and play" altogether. It makes perfect sense to differentiate component-based vs. "packages" or kits where a manufacturer or component integrator sells a branded SHS as one big package. But whether it is "plug and play" or requires professional installation is a distinction without a difference, considering that there is no such thing as a true plug and play SHS (we're imagining a fantasy if we think that the average consumer will successfully do so). Systems that can be "feasibly installed" by a consumer is a strange way to draw the line: picos might be plug and play, SHS are not.	There are a number of fair points and this is worth considering but we do not think we will make that change in the initial round of pilot testing. We will still be looking at plug and play but there are number of challenges in defining the boundary between what is plug and play and what is not. We will value additional input and perspectives from the industry.
Would you consider a separate subset of requirements/metrics for systems specifically designed for PAYG or solar as a service models? Or is the goal to make the standard ubiquitous?	As we examine PAYG systems we will think carefully about specific issues/requirements/tests we will need to consider. Broadly we want to follow a general set of principles related to truth in advertising and durability and we want to apply this across all system types, but we understand there are nuances across system types.
manufacturers usually provide warrantee in hours or year. rural people sometime operate more time than recommended time per night. in this case, what would be the warrantee?	We have been thinking of it in terms of years for the sake of simplicity. To have a requirement for a consumer facing warranty on the package from the point of retail sale (not when it enters the distribution chain), we are open to discussion on the appropriate minimum length. We want to have a minimum length that is long enough to be credible. A warranty plays a key element in the quality of the product as it is an indication that the manufacturer is willing to stand behind the quality and durability of a system. On the other hand it is hard to use warranty as a primary element as it is very difficult to evaluate whether people are effectively servicing these warranties across all the different markets they are operating in. Warranties are a very useful aspect but have limitations in terms of testing. We are interested in feedback on the minimum length before finalizing anything. Warranty is not meant to be an estimation of the product life but a minimum period for after sales service.
3 years warranty is ok but it does not mean that after 3 years system will not work. so, product life should be more than warranty period	Thank you for your comment. We look forward to hearing more opinions on this subject as we develop the methods.

QUESTION	ANSWER
Just a thought - I cant think of any other product I can buy on the market in the US for $200 or less that would come with a 3 year warranty. I'm not opposed to it, but I think we should be realistic about the costs that it adds.	When people think of SHSs they think of lifetimes of the order of 20 years so this must be considered. We see our role as ensuring there is a warranty and a minimum length that provides credibility to the program and it makes sense for manufacturers to use this to differentiate themselves from others in the market. We are interested in continuing to think about this and continuing to debate and discuss. These systems do typically represent a very significant purchase for those who are buying them.
Regarding Brian's comment. Remember our products often represent a large percentage of a customers annual income	Thank you for your comment. We look forward to hearing more opinions on this subject as we develop the methods.
Can it be technically ok to provide warranty in wh or kwh per year?	We are thinking in terms of a period, a number of years, but we would be interested in hearing comments about why a different framework should be used. Perhaps follow up with us over email.