Standards, Quality and Test for Fuel and Cooking Equipment

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WACCA 1st Regional Stakeholder Workshop, Ouagadougou, Burkina Faso 23-25 April 2013
Outline of the Presentation

• Definitions

• What do we need?

• History of quality assurance approaches relevant for Western Africa

• Components of quality assurance
  – Stove type quality
  – Stove production quality
  – Fuel quality

• Relevant actors

• Questions / Discussions
Definitions

• **Standard**: document of reference, established by consensus and approved by a recognized body (ISO)

• **Quality**: Degree to which a set of inherent characteristics fulfills requirements (ISO)

• **In practice**
  – Quality of a product means that it meet end-user expectations in terms of performance, functionality, reliability and affordability

• **Quality is the result of end-user feeling**
  – Introduce notions of “product/service” and “client”
Definitions

• **Protocol**: a method for testing product

• **Testing protocols of cookstove**:
  
  – Water Boiling Test (WBT): is a rough simulation of the cooking process that intended to measure stove performance to boil and simmer water. Tool for evaluating stove design as well as comparing different stoves using a common protocol.
  
  – Controlled Cooking Test (CCT): intended to determine stove performance by preparing common foods cooked by local people in a controlled setting. Design to assess the performance of improved cookstoves relative to what it is primarily meant to replace.
  
What do we need?

- Meet societal demand: in the global market of today, organizations are challenged to deliver quality products and service that meet customer expectations.

- Technology development: affordable and efficient cookstoves that meet global standards.

- Development of protocols, standards and benchmarks.

- Testing and certification.

- Labeling for cookstove can have categories (for example Silver to Platinum).

- Testing protocols – emphasis on field testing.
History of Quality Assurance approaches relevant for West Africa

• In 2005, CILSS/UEMOA developed and approved a mechanism for cookstoves labeling.

• The proposed approach includes:
  – Accreditation of qualified laboratories to perform WBT, CCT, KPT and safety tests
  – Awarding of quality label to producers, providers or developers
  – The « Cahier de charges d’utilisation du Label » contains a model contract for the use of this label stipulated by CILSS / UEMOA.

• It does NOT define minimum standards or tiers

• What has been realized of this plan?
History of Quality Assurance approaches relevant for West Africa

- **The Global Alliance for Clean Cookstoves (GACC)**
  - Is promoting International Standards (in process to develop ISO Standards for cookstoves)
  - Updates testing protocols version: WBT, safety parameters
  - Defines tiers for absolute standards on fuel consumption, emissions, IAQ, safety
Components of quality assurance
1) Parameters for stove type quality

- **Cooking power**
  - Speed to boil water
  - Turn down ratio (ratio of the stove’s high power output to its low power output)
  - Firepower
  - Thermal efficiency

- **Fuel consumption**
  - Quantity of fuel consumed for a given task
  - Type of fuel that can be used

- **Emissions**
  - Quantity of health endangering toxic emissions?
  - Quantity and type of climate relevant GHG emissions?

- **Durability**
  - Expected lifetime?
  - Up to which point of decay a stove can be considered as an improved stove?

- **Stove Security**
  - Sharp Edges and Points
  - Stability, Cookstove Tipping
  - Flaming fuel falling out of Containment
  - Surface Temperature and Heat Transmission to Surroundings
  - Flames surrounding the cooking pot

- **Convenience**
  - Is the stove appropriate to the usual tasks in an average household?
Components of quality assurance

2) Testing the stove type quality in the Laboratory

• Laboratory:
  – WBT, CCT for fuel consumption
    Standard methods of several Institutes
  – WBT with emission testing
    CERER is setting up a LEMS
  – Security protocol
    Methodology available, however rarely used
  – Durability test
    Methodology has to be developed
Components of quality assurance
3) Testing the stove type quality in the household

- Monitoring in the households
  - Fuel consumption: KPT
    Standard methodology
  - Indoor Air pollution
    First approaches with appropriate equipment
  - Durability
    Methodology for systematic monitoring has to be developed
  - Convenience / acceptance
    Standard methodology: acceptance tests
Components of quality assurance
4) Stove production quality

• **Parameters**
  - Are all stoves conform with the approved stove type: measures, material, tolerances?
  - Are all the produced stoves of the same quality?

• **Methods to test and insure the stove production quality**
  - Adequate training of the producers, providing tools for quality management
  - Control of the produced stoves
  - Certification of products or producers
  - Labeling
Components of quality assurance

- --> Need for fuel quality standards

Quality parameters:

- Sustainable source
- Minimum product quality in terms of
  - Heat value
  - Low Emissions

Up to now very few approaches
Relevant Actors?

• Improving the quality of stove types, Development of better stove types
  - Research Organization: Stove testing, recommendations for stove improvement
  - Bureau of Standards: defines minimum quality stove types
  - International Donors: may define minimum quality for their projects
  - Private Entrepreneurs: develop high performance products

• Monitoring and Management of stove production quality
  - Project implementing organizations: training of producers, quality monitoring
  - Private Entrepreneurs: guarantee a high quality of their products as a marketing argument
Pertinent Questions / Suggestions for discussion

• Relevance of lab tests <-> field tests

• Emission testing is interesting. However, it leads to testing procedures far from reality.

• Life time of improved stoves?

• Does it make sense to fix absolute minimum standards (GACC)? Or is it more realistic to focus on improvement rates (40% GIZ)

• Quality <-> Price and affordability

• Organization of a quality management system:
  – Which criteria?
  – Powerful actors?
Thank you for your attention

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