



## Interim Reporting Requirements for IWA Tiers of Performance

*January 2013*

*These reporting requirements incorporate comments from Alliance Partners from a public comment period (<http://community.cleancookstoves.org/discussions/viewtopic/22/80>), November – December 2012.*

**Goals:** To build on the progress from the February 2012 ISO International Workshop Agreement (IWA)<sup>1</sup> to establish interim standards for cookstoves, this document provides interim guidance for 1) how the Alliance and its Partners will standardize reporting of testing results for IWA Indicators and 2) ensuring independent and reliable testing and reporting for the IWA Tiers of Performance, while leaving room for integrating additional protocols (existing and new) into the IWA framework. This guidance will apply until international standards are formally developed and established, which may include lessons learned from these interim guidelines.

### **Background: ISO International Workshop Agreement (IWA)**

In February 2012, more than 90 stakeholders from 23 countries met in The Hague to establish consensus on an ISO IWA that provides interim guidance for rating cookstoves on four performance indicators: fuel use, total emissions, indoor emissions, and safety. Each indicator has multiple Tiers of Performance (0 to 4) in order to highlight progress that has been made while encouraging further improvement. The IWA includes Tiers of Performance for the WBT 4.1.2<sup>2</sup> and for the Biomass Stove Safety Protocol<sup>3</sup>, and also provides a framework for establishing Tiers of Performance for additional test protocols. The IWA serves as a guideline for policy-makers, investors, manufacturers, consumers and others in the cookstoves community and it will inform any future updates to internationally agreed-upon cookstove standards and protocols. This IWA, with unanimous support among meeting participants, represents a significant step forward in global efforts to scale up clean cookstoves and fuels. The ISO International Workshop was hosted by the Global Alliance for Clean Cookstoves and the Partnership for Clean Indoor Air, and chaired by the American National Standards Institute.

### **Standardized Reporting Format (See Figure 1)**

Each stove may have up to four (4) ratings for Tiers of Performance, one each for Efficiency/Fuel use, Emissions, Indoor Emissions, and Safety. Each of these four ratings will be based on lowest tier from the individual metrics for that indicator. For example, if a stove is tested to have Tier 2 for High power Thermal efficiency and Tier 3 for Low power Specific consumption, the rating for Efficiency/Fuel use will be Tier 2. The indicators and units are taken directly from the IWA. If performance indicators are added or modified at a future time, stoves may have additional ratings.


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<sup>1</sup> ISO International Workshop Agreement: <http://community.cleancookstoves.org/files/172>

<sup>2</sup> Water Boiling Test 4.1.2: [http://www.pciaonline.org/files/WBT4.1.2\\_0\\_0.pdf](http://www.pciaonline.org/files/WBT4.1.2_0_0.pdf)

<sup>3</sup> Biomass Stove Safety Protocol: <http://www.pciaonline.org/files/Stove-Testing-Safety-Guidelines.pdf>

Figure 1 – Standard Reporting Format<sup>4</sup>



**IWA Tiers of Performance Report**

<b>Cookstove</b>	<b>Manufacturer</b>	
	<b>Model</b>	
<b>Testing Center</b>		
<b>Protocol</b>		
<b>Fuel Used</b>		
<b>Pot Used</b>		
<b>Test Dates</b>		

These results were obtained in accordance with the IWA and the Global Alliance for Clean Cookstoves' reporting requirements.<sup>4</sup> This data and additional supporting data are shared publically through the Stove Performance Inventory.

<b>Signature</b>	
<b>Name</b>	

		Metric	Value	Unit	Sub-Tier
<b>Efficiency/Fuel Use</b>					
<b>Tier</b>	<b>3</b>	High power Thermal Efficiency		%	3
		Low power Specific Consumption		MJ/min/l	4
<b>Emissions</b>					
<b>Tier</b>	<b>2</b>	High power CO		g/MJ <sub>d</sub>	2
		Low power CO		g/min/l	3
		High power PM 2.5		mg/MJ <sub>d</sub>	4
		Low power PM 2.5		mg/min/l	3
<b>Indoor emissions</b>					
<b>Tier</b>	<b>3</b>	High power Indoor emissions CO		g/min	3
		Low power Indoor emissions CO		g/min	4
		High power Indoor emissions PM 2.5		Mg/min	3
		Low power Indoor emissions PM 2.5		Mg/min	3
<b>Safety</b>					
<b>Tier</b>	<b>4</b>	Points from 10 weighted safety parameters		points	

**Tier 0 → Improving Importance → Tier 4**

<sup>4</sup> The performance indicators and metrics may be updated as additional protocols are mapped to IWA Tiers of Performance. Tier and Sub-Tier Values are included for illustration.

**Individual Scores for Safety Assessment Criteria**

Assessment Criteria	Score (1 – 4)	Multiplier
Sharp Edges and Points		1.5
Cookstove Tipping		3.0
Containment of Fuel		2.5
Obstructions Near Cooking Surface		2.0
Surface Temperature		2.0
Heat Transmission to Surroundings		2.5
Temperature of Operational Construction		2.0
Chimney Shielding		2.5
Flames Surrounding the Cookpot		3.0
Flames/Fuel Exiting Fuel Chamber, Canister, or Pipes		4.0

**For testing results to be reported as IWA Tiers, the following five (5) criteria must be met:**

1. Methodology and equipment must meet the criteria outlined in the IWA document and any updates that have been reviewed by Alliance Partners during a public comment period or that have been established as part of international standards development.
2. The testing must be conducted using protocols that have been mapped to IWA Tiers. For protocols not currently mapped to IWA Tiers, Tiers of Performance must be reviewed by Alliance Partners, evaluated by a technical committee with representation from testing experts, manufacturers, and other stakeholders, and following any established procedures for developing international standards. The acceptability of a protocol for a particular stove and tier designation should be determined by the ability of the test procedure to repeat the performance metric within one-third of the distance between tiers, under conditions that are consistent with the test specification.<sup>5</sup>
3. The testing data must be shared publically through the Stove Performance Inventory.<sup>6</sup>
4. The testing for a stove must be conducted by technicians and a testing center with no financial stake in the stove being tested or an alternative stove. Testing centers should provide complete disclosure of personal or institutional investments in any stove or energy related technologies by the lab, its subsidiaries or parent organizations, or its personnel.
5. The stove(s) tested must be randomly selected from the production line and should not be a prototype under development.

**Next Steps**

Studies and discussions will continue for identifying tiers for additional protocols, including new or refined protocols that address additional indicators or additional stove and fuel types. The Alliance will work with the global consortium of regional testing and knowledge centers to ensure that a stove tested at different centers will have comparable and standardized results. The Stove Performance Inventory will be updated manually until tools and procedures are established for adding new testing data in a more streamlined way.

These interim reporting requirements may be updated as part of any future international standards process. For example, requirements for testing multiple stoves randomly selected from a production line may be added. These interim reporting requirements may also be applicable for developing consensus on product labels, but these current requirements focus on reporting of testing results.

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<sup>5</sup> Due to multiple possible interpretations, this criterion will need to be discussed further. A proposed clarification is that this criterion refers to the repeatability of the testing procedure (including all replications specified by the procedure) rather than the variability or repeatability of replications within one set of tests for one stove. For example, we may perform the WBT (at least 3 replications) and get an average value of 100 mg/MJ, then we repeat the WBT (at least 3 replications) and we get an average value of 120 mg/MJ. The difference is 20 mg/MJ - less than one-third the distance between tiers (the distance between Tiers 3 and 4 is 127.  $1/3 \times 127 = 42$  mg/MJ). Future studies and protocol development are needed to analyze the uncertainty in the measurements and results.

<sup>6</sup> Stove Performance Inventory Report:

[http://www.cleancookstoves.org/resources/reports-and-research/?alliance\\_reports\\_research=alliance-reports&other=standards&other=testing](http://www.cleancookstoves.org/resources/reports-and-research/?alliance_reports_research=alliance-reports&other=standards&other=testing)