PARTNERSHIP FOR CLEAN INDOOR AIR

Innovations in GS Methodology :
Technologies and Practices to Displace Decentralized Thermal Energy Consumption

The Gold Standard Foundation
September 27, 2011

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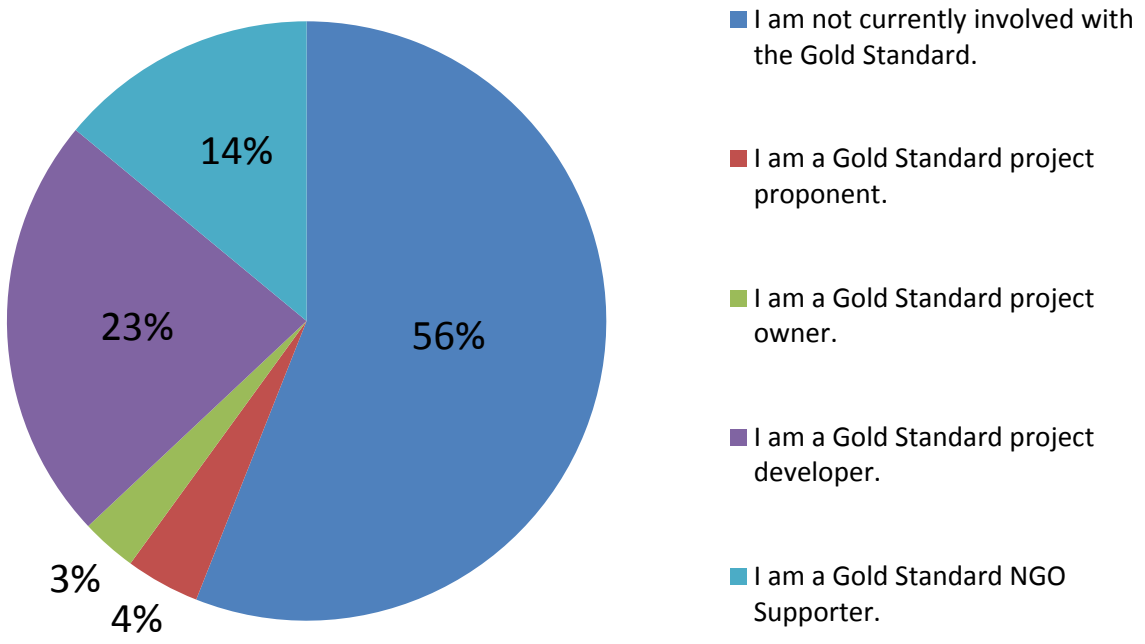
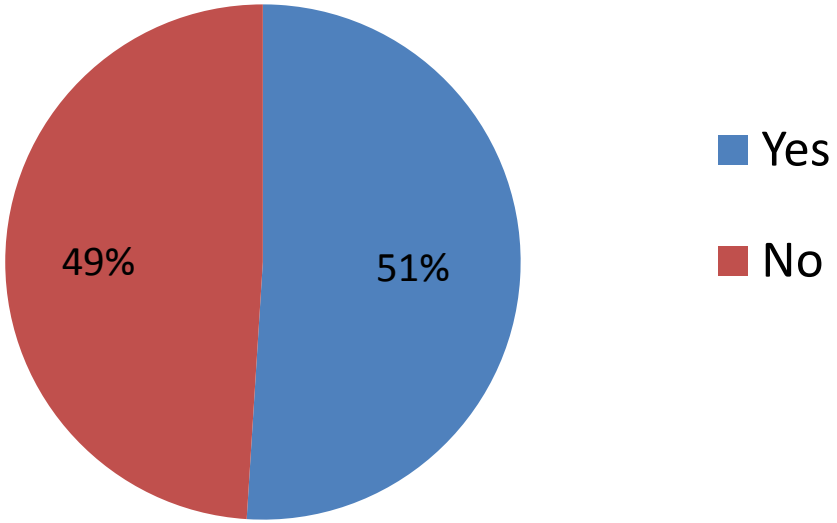
Audience Snapshot

Please describe your involvement with the Gold Standard.



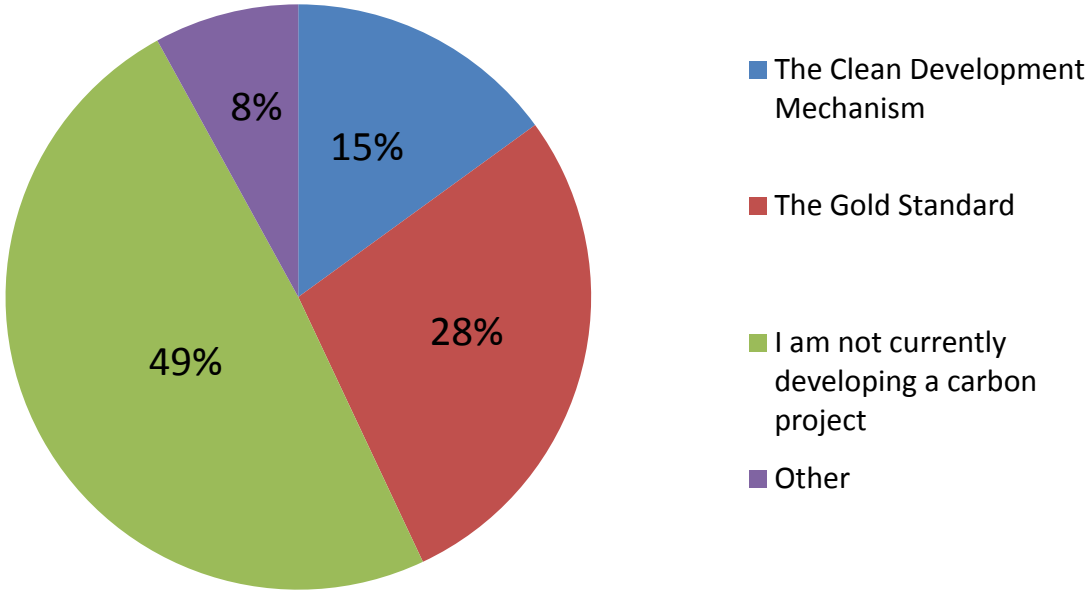
Audience Snapshot

Are you currently developing a cookstove carbon emission reduction project?



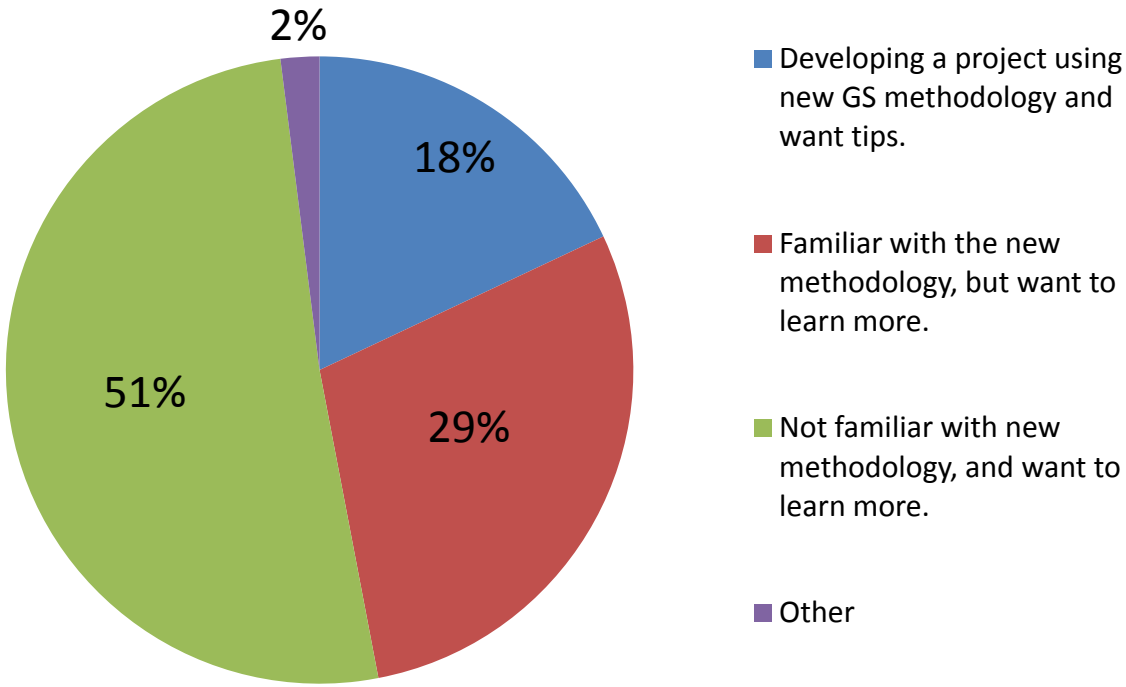
Audience Snapshot

If you are developing a cookstove carbon project, which standard are you using?



Audience Snapshot

Please explain your primary interest in attending this webinar.



Presenters

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Summary: Innovations

- Integration of all decentralized thermal technologies/practices in domestic and non-domestic premises
- Integration of similar methodologies
- Expansion of project boundary to multiple countries
- Post registration addition of new scenarios
- Simplified additionality justification criteria
- Post registration submission of project specific studies
- Concept of Adjustment factors
- Simplified monitoring requirements

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Presentation overview

Section I Methodology Applicability

Section II Baseline / Project studies

- Project boundary
- Selection of baseline scenarios and project scenarios,
- Additionality
- Baseline & project studies
- Performance field tests
- Adjustment factors

Section III Monitoring methodologies

- Monitoring procedure
- Adding New Baseline scenario

Applicability (1 of 2)

- Technologies and/or practices that reduce or displace GHGs from **thermal energy consumption for domestic and /or non-domestic premises, residential, institutional, industrial or commercial facilities**. For example;
  - Technologies*:

    Fossil fuel cookstoves, ovens, dryers, space and water heating, solar cookers, biodigesters, safe water supply and treatment technologies that displace water boiling
  - Practices:

    Improved application of such technologies, shift from non-renewable to renewable fuel (shift to plant oil fired stoves), improved storage and drying of fuels

*Energy output shall be less **than150 kW/unit**

Applicability (2 of 2)

Additional applicability criteria to ensure environment integrity

i. Indoor air pollution (IAP)

- Ensure that there is **no negative impact on indoor air quality due to project activity using new biomass types**
- The project developer shall demonstrate by using evidences for example **protocols for comparative field tests** which reflects the baseline and project emissions with respect to GHGs and IAP

ii. Mechanism for definitive discontinuity of the old technology:

- Must have incentive scheme or similar mechanism to **encourage displacement of old technology** use as backup or auxiliary technology (if any) for example heating during winter season

Presentation overview

Section II Baseline/Project studies

- Project boundary
- Selection of baseline scenarios and project scenarios,
- Additionality
- Baseline & project studies
- Performance field test
- Adjustment factors

Project Boundary

- For project boundary following three variable shall be clearly defined;

Variable	Description
Project boundary	Physical, geographical sites of the project technology, fuel collection and production (baseline and project scenario), disposal and or treatment facility associated with fuel processing
Target area	Regions/ province **within a single country or multiple countries** where the identified baseline scenario is assessed uniform across political borders
Fuel production and collection area	The area within which this woody biomass can reasonably be expected to be produced, collected and supplied

- Non-CO_2 GHGs emission avoidance from fuel production/processing for example Charcoal, are claimable under GS Cookstove methodology.

Selection of Baseline and Project scenario (1of 3)

Baseline scenario

- Typical fuel consumption patterns of **"target population"** is a representative baseline scenario

- **Multiple baseline scenarios** may exist depending on local fuel and technology use patterns. For example:
  - One baseline scenario may represent **rural end users predominantly using inefficient wood stoves**.
  - A second baseline scenario may represent **a target population predominantly using inefficient charcoal stoves.**

- A baseline scenario is not necessarily required for comparison to each technology in the project activity. For example
  - Different improved wood stove models in the project activity could be compared to the same wood baseline scenario, and different improved charcoal stove models in the project activity could be compared to the same charcoal baseline scenario, as appropriate.
- **Progressive installation of the project technology with Fixed baseline:**
  - Fixed Baseline
    - The Project activities targeting **non-industrial applications** or where all units are installed at the start can **by-default** use **fixed baseline**

Baseline scenario (3 of 3)

- For all project activities where renewable crediting period is adopted, the baseline must be reassessed on renewal of crediting period

Project Scenario

- The fuel consumption pattern of end users within a "target population" that adopt a project technology
- May identify multiple project scenarios given the different types of project technologies included in a project activity; and
- Independent **project scenarios can be credited by comparison to the same baseline scenario** if applicable.
  - For example, the same baseline scenario for inefficient wood stoves could be compared to separate project scenarios for two different improved wood stove models in the project activity.

- Project technologies with **similar design and performance characteristics** may be included under a single project scenario.
  - For example, if improved cook stoves are based on the same fundamental combustion technology and their respective thermal efficiencies or specific consumptions do not differ by more than +/-5%.
  - Project technologies with significantly different performance characteristics (e.g. fuel consumption characteristics in the case of stoves) are treated as independent project scenarios and hence monitored and credited separately.

How & When to identify different Baseline and Project Scenarios

- Must consider distinct baseline and project scenarios when the project activity targets "end user populations" that consume **significantly different fuels or when different technologies** are considered in a given project activity.

- All expected baseline and project scenarios shall be defined in the project documentation on time for validation and registration review.

Additional baseline and project scenarios

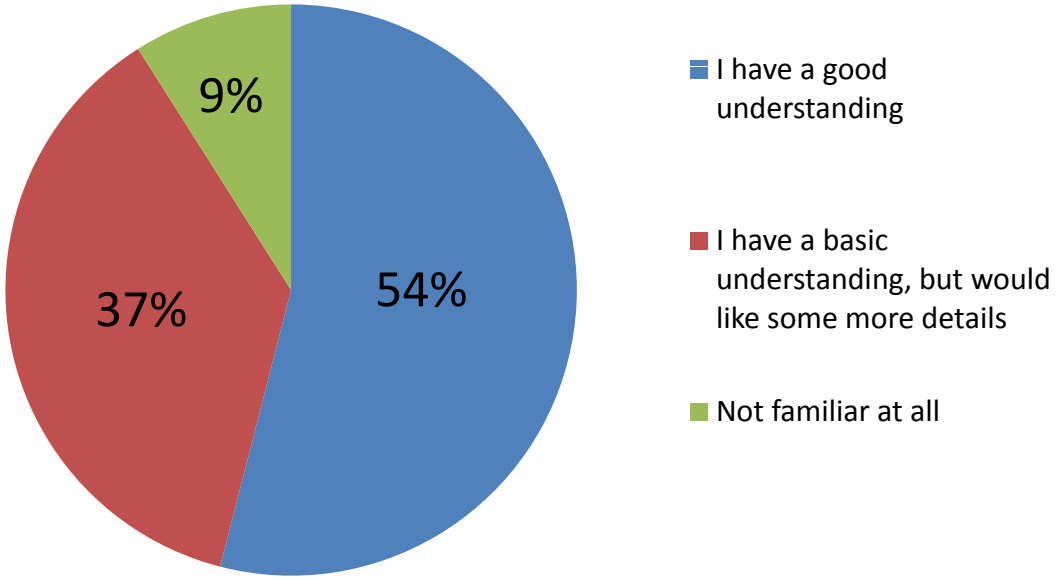
- Can still be added to a **project activity at any time during the project crediting period** upon approval of a request for design changes, as per Gold Standard rules.
- Emission reductions cannot be credited for a new project scenario, or in relation to a new baseline scenario, until the respective project studies or baseline studies have been conducted
- Alternatively, adjustment factors, can be applied to existing baseline and project scenarios to account for less significant variability in fuel consumption or technology, without the need to create a new baseline or project scenario.

Suppressed Demand (Annex 2)

- If the level of energy service is not sufficient to meet human development needs due to lack of financial means and/or access to modern energy infrastructure or resources:
  - In such case, the level of thermal energy consumption in the baseline scenario will not correspond to **the pre-project situation** but **to a satisfied demand level**, which will be equal to or lower than the project level of satisfied demand.

Audience Polling Question

How well do you already understand the concept of additionality?

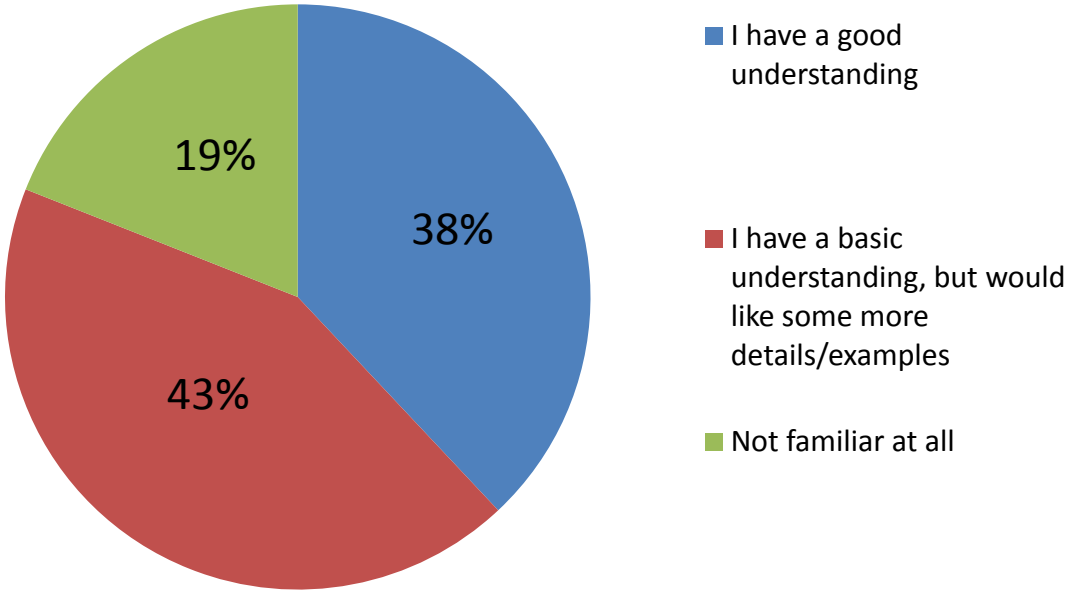


Additionality

- Shall be justified applying
  - UNFCCC "**Tool for the Demonstration and Assessment of Additionality**", or
  - An approved **Gold Standard VER additionality tool, or**
  - UNFCCC "Guidelines for Demonstrating Additionality of Renewable Energy Projects =<5 MW and Energy Efficiency Projects with Energy Savings <=20 GWh per year" (only regular cycle projects), or
  - If **less than 20% of the population has** adopted the project technology in the target area, the technology can be qualified as **"first of its kind"** and it will be considered deemed additional.

Audience Polling Question

How familiar are you with the concept of non-renewable biomass and how it is calculated?



Baseline Studies

- Baseline Studies include:
  - Baseline non-renewable biomass (NRB) assessment, if biomass is one of the baseline fuels
  - Baseline survey (BS) of target population characteristics
  - Baseline performance field test (BFT) of fuel consumption
- Findings of the **performance field tests can be submitted post-registration**, on time for the verification and prior to the request for issuance
- In such conditions expected **baseline emissions estimation is required, supported by appropriate and credible sources of information**

Project Studies

Project studies include:

- Project non-renewable biomass (NRB) assessment
- Project survey (PS) of target population characteristics
- Project performance field test (PFT) of fuel consumption

- Project survey and PFT are conducted with end users representative of the project scenario target population and currently using the project technology

- Findings of the **PFT can be submitted post-registration**, on time for the verification and prior to the request for issuance.

- In such case, expected project emission must be supported by **appropriate and credible sources of information**.

Non-Renewable Biomass Assessment

- The approach to calculating the Non Renewable Biomass (NRB) fraction is defined in Annex I of the methodology
  - Gold Standard – NRB assessment approach
  - Clean Development Mechanism - AMS II.G (small scale methodology) assessment approach
- Required at the time of registration
- At the time of renewal of crediting period

Baseline and Project surveys

Objective	To collect information **on target population characteristics, baseline technology use, fuel consumption, leakage, and sustainable development indicators**
Survey Representativeness	In person interviews with **a robust, representative sample of end users users** targeted in the project activity without project technologies
Survey Sample Sizing	Random sampling, following these guidelines for minimum sample size: **Group size <300:** Minimum sample size 30 or population size, whichever is smaller Group size **300 to 1000:** Minimum sample size 10% of group size Group size **> 1000** Minimum sample size 100

Baseline and Project surveys (Continued..)

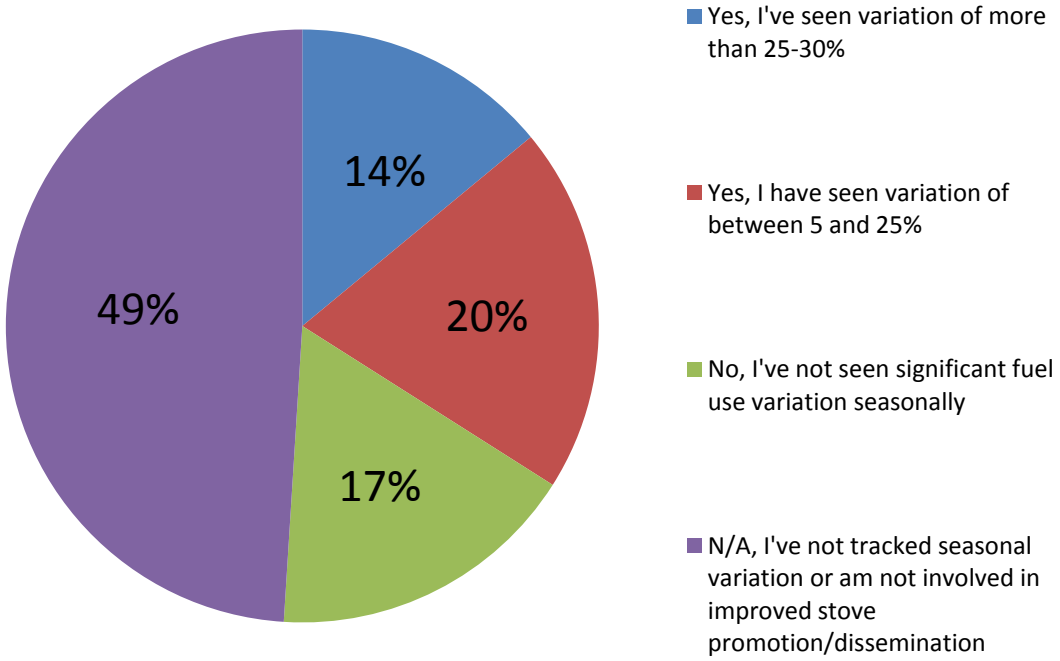
Data Collection	**For each identified scenario, following information shall be collected** **User follow up:** Address or location and Mobile telephone number and/or landline telephone number (when possible) **End user characteristics:** a. Number of people served by baseline technology b. Typical baseline technology usage patterns and mode (commercial, institutional, domestic, etc.) **Baseline technology and fuels** a. Types of baseline technologies used and estimated frequency b. Types of fuels used and estimated quantities c. Seasonal variations in baseline technology and fuel use d. Sources of fuels e. NRB assessment

Performance Field Tests

Objective	The baseline and project performance field tests (baseline field tests [BFT] and project field test [PFT]) **measure real, observed technology performance in the field** Consumption must be measured with a representative sample of end users under each defined baseline scenario (in the absence of the project technology) and project scenario.
What must be considered for field tests [FT]s?	**- Transparent, and evidently conservative** - Random sample selection so as to not introduce a material bias, - Shall account the **impact of daily and seasonal variations** on the expected average fuel consumption savings

Audience Polling Question

If you have monitored seasonal variation in your stove program, have you witnessed significant seasonal variation in fuel use?



Performance Field Tests (continued..)

Representativeness	- Representative monitoring of typical technology and fuel use practices
What must be taken care off?	- The households/institutions behave and consume fuel normally, using whatever technologies they normally use - No influence to use a specific stove or fuel during the monitoring period, nor deviate from typical stove and fuel practices. - Account for **fuel consumption implications**, if the baseline technology still operate as backup or complementary units in parallel with project technologies -PFT is required for a 'zero emission' project technology as well

Performance Field Tests (continued..)

Sample Sizing and Statistical Estimate of the Fuel or Emission Savings	Whenever the baseline fuel and project fuel are the same (e.g. deployment of improved cook stove for the reduction of non-renewable biomass use), the statistical analysis can be conducted with respect to fuel savings per unit. In cases where baseline fuel and project fuel are different (different emission factors), the statistical analysis must be conducted with respect to emission savings per unit.
Options for sample sizing	**90/30 rule.** When the sample sizes are large enough to satisfy the "90/30 rule," i.e. the endpoints of the 90% confidence interval lie within +/- 30% of the estimated mean, overall emission reductions can be calculated on the basis of the estimated MEAN annual emission reduction per unit or MEAN fuel annual savings per unit.
*Information on the 90/30 rule and other guidance will be made available on the Resources page at the end of the presentation.	

Performance Field Tests (continued..)

90% confidence rule.

When the sample sizes are such that the "90/30 rule" is not complied with, the emission or fuel saving result is not the mean (or average) test result, but a lower value, i.e. the LOWER BOUND of the one-sided 90% confidence interval.

Adjustment factors

What is purpose of adjustment factors ?	To fine tune the baseline and project scenarios, **without requiring project proponents to independently monitor new baseline and project scenarios to** account for **variability in fuel savings** due to differences in project technology type, size, usage pattern, and other pertinent variables
How to develop adjustment factor?	- **Quantitative assessment and analysis of baseline and project monitoring studies**, - As well as through additional targeted lab and field monitoring.
Example 1	- Conduct project field tests [PFT] for an improved **charcoal stove with a 500 cm3 fuel** chamber - Apply the fuel consumption in the baseline and project scenario for **similar improved charcoal stove models of different sizes** - Based on ratio of the difference in fuel chamber volumes as long as clear **correlations between stove size and standard adult-meals are identified and demonstrated**

Adjustment factors (Continued..)

Example 2	-The same wood stove may be used by some end users for **domestic cooking and others for commercial cooking**. - Fuel consumption in the **baseline and project scenario is measured for the domestic users only**
	- Apply the fuel consumption measured for the domestic users to others for commercial cooking - Adjustment shall be made based on measurements of **cooking frequency and fuel use differences from usage surveys** and **monitoring surveys** that capture information sufficient to compare domestic and commercial end users.
What must do or don't do?	- DO NOT estimate the consumption of **one type of fuel based on the observed consumption for a different fuel**

Adjustment factors (Continued..)

- DO take **representative sample** with appropriate weighting in pertinent monitoring studies to ensure adjustments within scenarios and across scenarios are realistic.

- For example, monitoring two sizes of the same stove model could show that the larger stove cooks food for more people but is **not more efficient per person-meal**.

- In this case a size adjustment factor for person-meals cooked would be appropriate but **an efficiency adjustment factor would not be appropriate**

Presentation overview

Section III Monitoring methodologies

- Monitoring procedure
- Adding New Baseline scenario

1. Monitoring Methodology

- Monitoring Procedure
  - Provides guidelines for total sales record, project database, project monitoring survey, usage survey, baseline field test [BFT] & project field test [PFT]

- **A. Total Sales Record:**
  - Must maintain an accurate and complete sales record
  - Sales record is substituted by a **"dissemination record" or "installation record"** in projects with noncommercial distribution or dissemination of a practice
  - Purpose: households for surveys and tests need to be selected from sales record

A. Total Sales Record: (Continued..)

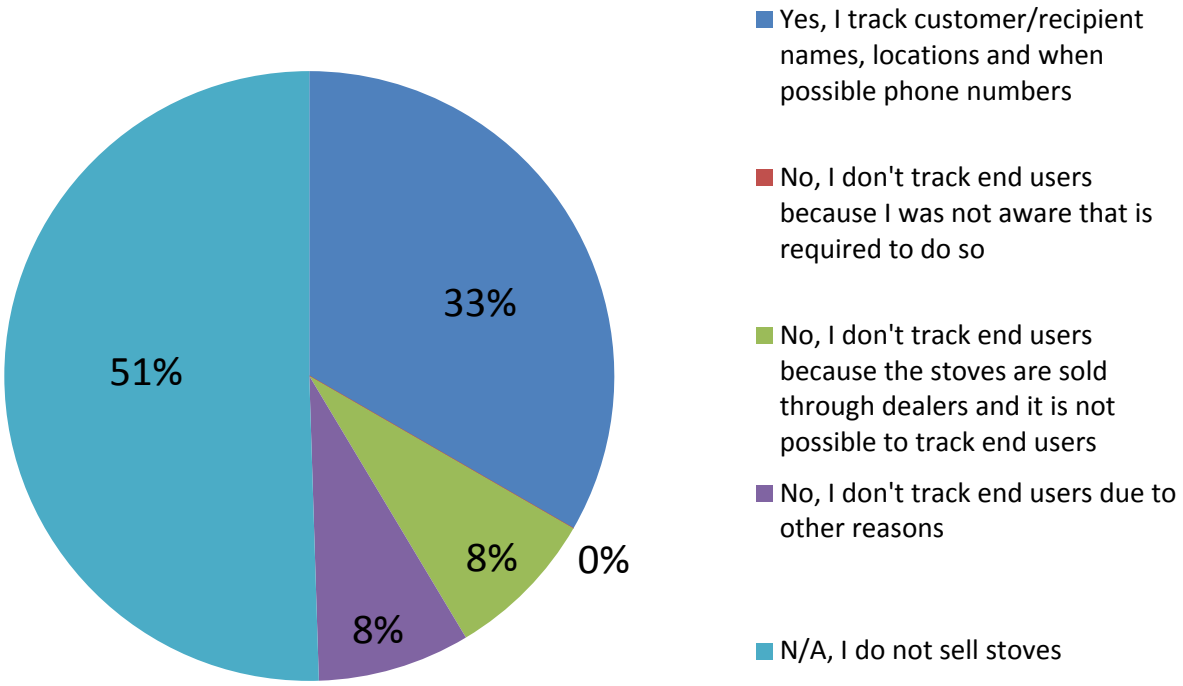
Variable	Description
Monitoring frequency	Updated and maintained continuously
Date of Sale	**Date of installation and commencement of use of the technology**
Geographic area of sale	-
Model/type and quantity of project technology sold	-
Name and telephone number (if available), and address	All end users except in cases where **this is not feasible**. • In such cases, collection must be enough for representative sampling in order to ensure an adequate end user pool for random sampling. • In all cases this **should not be less than 10 times the survey and field test sample sizes** (including usage surveys for each age of product.)
Mode of use	-

B. Project Database

- Shall be maintained and updated continuously
- Derived from the total sales record (or dissemination record in case of non-commercial distribution)
- Technologies aged beyond their useful lifetime, as established in the usage survey, shall be removed from the project database and no longer credited.

Audience Polling Question

If you sell stoves, do you already maintain an active project database of sales or dissemination records?



C. Ongoing Monitoring Studies: (1 of 2)
a) Monitoring Survey

Objective	- To collect information on year-to-year trends **in end user characteristics** such as technology use, fuel consumption and seasonal variations
Monitoring frequency	- Annually
Sample size and **data collection**	- Follow the same approach as for baseline survey - For non-industrial applications, the monitoring survey is only conducted with end users representative of the project scenario and currently using the project technology

a) Monitoring Survey (2 of 2)

Monitoring Survey Representativeness:	- Common sampling approaches such as **clustered random sampling or** - Follow ***Application Guidance, of the General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities (EB 50 Report, Annex 30*** for more details on other applicable sampling approach)
When shall survey be conducted ?	- Surveys can be carried out at any time(s) throughout the year with care taken to collect information pertaining to seasonal variations in technology and fuel use patterns

b) Usage Survey (1 of 2)

Objective:	To collect information on a single usage parameter that is weighted based on **drop off rates that are representative of the age distribution for project technologies** in the total sales record
Monitoring frequency	Annually, or more frequently, and in all cases on time for any request of issuance
Minimum age group to be included in surveys	- In the first year of use (age 0-1), only technologies that have been in use on average longer than 0.5 years may be counted - In the second year of use (age1-2), must have technologies that have been in use on average longer than 1.5 years, and so on

b) Usage Survey (2 of 2)

How to select the representative sample for usage survey?	- If only technologies in the first year of use (age 0-1) are being credited, a usage parameter must be established through a usage survey for technologies age 0-1. - If an equal number of technologies in the first year of use (age 0-1) and second year of use (age1-2) are credited, a usage parameter shall be weighted to be equally representative of drop off rates for technologies age 0-1 and age1-2.
Minimum Sample Size	minimum **total sample size is100**, with at least 30 samples for project technologies of each age being credited. For example; If technologies of age1-5 are credited, the usage survey must include 30 representative samples from each age for a total of 150 samples.

c) & d) Project Field Test and baseline FT Update

Objective:	To account for changes in the project scenario over time as project technologies age and new customers are added, also as new models and designs are introduced
Monitoring frequency	Every two years

- Baseline field test [FT] requirements are same as project field test [PFT] except in cases of fixed baseline implying no need for a BFT

Summary of project Preparation and Monitoring Schedule (for one crediting period) [1 of 2]

Schedule	Prior to validation	Prior to first verification	Annual: after first verification	Every two years: after first verification
Emission reduction (ER) units estimation for PDD	√			
Baseline studies				
NRB assessment	√			
Baseline survey	√			
Baseline FT (except where default applied)		√		

Summary of project Preparation and Monitoring Schedule (for one crediting period)

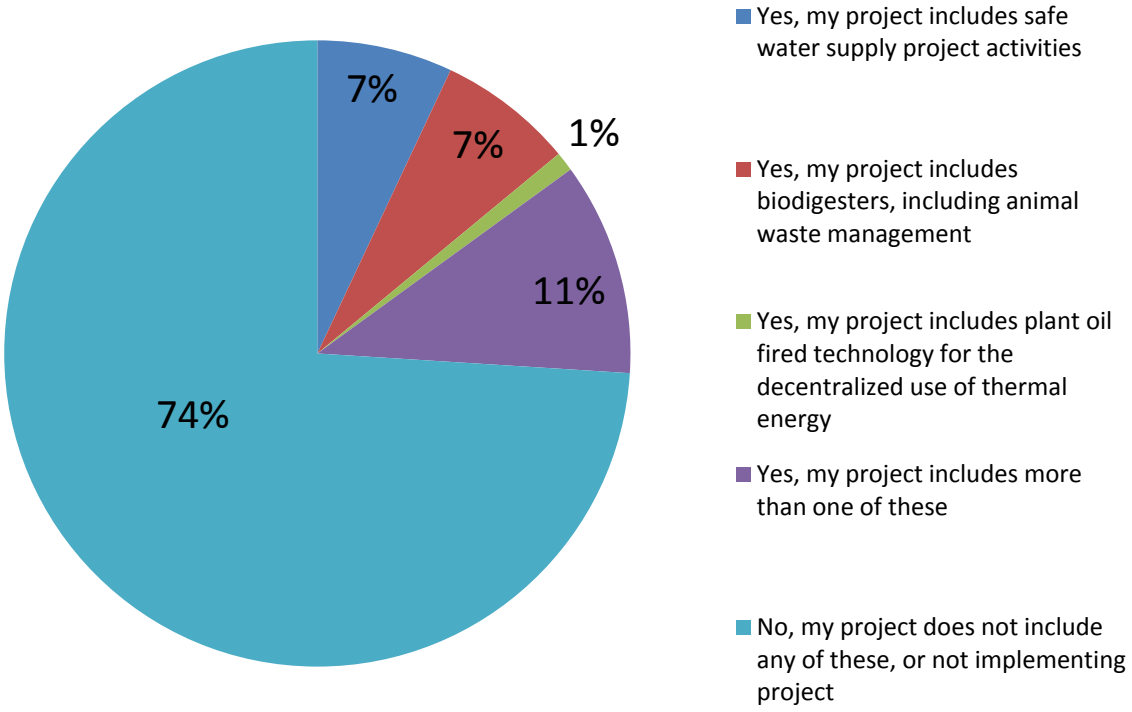
Schedule	Prior to validation	Prior to first verification	Annual: after first verification	Every two years: after first verification
Project studies				
Preliminary estimation – ER, NRB, etc.	√			
Project survey		√		
Project FT		√		
Maintenance of total sales record and project database				
Usage survey			√	
Monitoring survey			√	
Field Test updates				√
Leakage assessment				√
Updating NRB	As proposed by project proponent			

Integration of other methodologies

- Safe water supply project activities (Annex 3)
- Biodigesters, including animal waste management (Annex 6)
- Plant oil fired technology for the decentralized use of thermal energy (Annex 7)

Audience Polling Question

Does your project incorporate any of the activities for which other methodologies are listed here?



Resources

- The GS methodology
  http://cdmgoldstandard.org/fileadmin/editors/files/6_GS_technical_docs/manuals_and_methodolgies/110411_TPDDTEC_Methodology.pdf
- CDM methodology (AMS II.G)
  http://cdm.unfccc.int/methodologies/DB/6U8JYO9XTLVZ8LJ7GUBSZP145BIDG2
- 90 / 30 precision rule

  Annex 4 of the GS methodology
- Additionality tool

  http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.1.pdf/history_view

Thank You