United Nations Framework Convention on Climate Change

Session 1: The Concept of PoAs

4. (Application of) Multiple Methodologies and Sampling standard to PoAs

Training-Workshop on CDM Post-registration Changes (PRCs)
and Programme of Activities (PoAs)
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Multiple methodologies in PoA

1. Background
2. Concept of cross effects
3. Pre approved SSC meth combinations
4. Requirements for eligibility criteria and sampling

Multiple methodologies in PoA

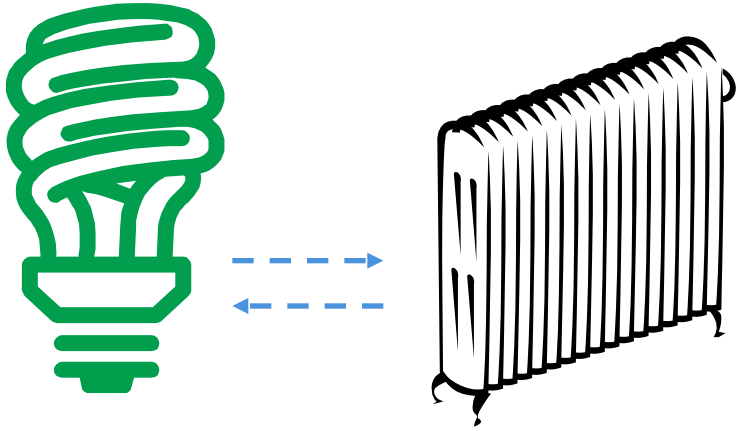
- One key requirement for applying combinations of technologies/measures and/or CDM methodologies;
  - **Account for cross effects (when present);**
  - **Cross effects** refer to the interactive effects between the technology(ies)/measures included in a CPA.

Understanding cross effects

➢ Cross effects examples

EE measures in a building

- Activity 1: efficient lighting bulbs
- Activity 2: efficient space heating/cooling
- Cross effect: Activity 1 will lead to increased/reduced fuel consumption for the same level of space heating/cooling.

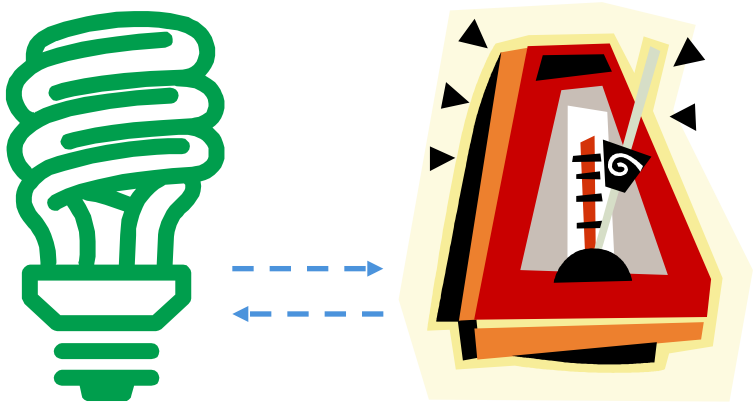


Understanding cross effects

➢ Cross effects examples

EE measures in a building

- Activity 1: efficient lighting bulbs
- Activity 2: efficient lighting control
- Cross effect: Activity 1 will lead to reduced energy consumption of the lights
- Overestimated ER if historic energy consumption for lighting is used by both activities



Requirements for Multiple Methodologies

- General guidelines to SSC methodologies – include pre approved combinations
- For other combinations account for cross effects;
  - EB68 “Guidelines for consideration of interactive measures for application of multiple CDM methodologies for PoAs”
  - For LSC methodology combinations, request clarification/revision to Meth Panel

SSC Pre approved combinations

- Combinations in SSC General Guidelines:
  - ✓ AMS-III.R + AMS-I.C; AMS-III.D + AMS-I.C + AMS-I.F; and AMS-I.C + AMS-I.F.
  - ✓ Any one of the Type III methane generating methodologies, with any one of the Type I methane utilizing methodologies
    - o i.e. AMS-III.H, AMS-III.D, AMS-III.F and AMS-III.G, with AMS-I.A, AMS-I.C, AMS-I.D and AMS-I.F.
    - o And more….
  - ✓ Any other combination of SSC methodologies as long as PP is able to demonstrate that there are no cross effects or cross effects are conservatively accounted for
    - ✓ Optionally seek clarification
    - ✓ Follow the procedures for request for deviations

General requirements

- The CME shall list in the PoA-DD (and the generic CPA-DD) various combinations of technologies/measures and/or approved methodologies that will be implemented.

- The CME shall elaborate the eligibility criteria for CPA inclusion and where applicable sampling plans for each of the combinations separately.

Sampling Standard

1. Background
2. Basis of Sample Size Calculation
3. Introduction to Sampling Standard
4. Sampling Guidelines

Background

- The purpose of sampling is to obtain (a) unbiased and (b) reliable estimates of the mean value of parameters used in the GHG ERs calculation.
- CDM PDDs or CDM-PoA-DDs, utilizing sampling for the determination of parameter values, shall include a Sampling Plan,
  - with a description of the sampling approach, important assumptions, and justification for the chosen approach.

Basis of Sample Size Calculation

Size of sampling effort depends on:

(i) Required Reliability: i.e. **Confidence / Precision**

a) **Confidence:** The chance that the population value lies within a certain distance of the sample estimate (typically, 95% or 90%)

- 95% is better than 90%

b) The distance is the **Precision**

- ± 5% is better than ± 10%

(ii) **The type of parameter of interest** e.g. **Proportion value (or percentage)** or **Mean value**

- Proportion of cook stoves still in operation after 3 years --- Proportion value
- Average usage hour of CFL (hours/day) --- Mean value

Basis of Sample Size Calculation

It also depends on:

(iii) The expected value of the parameter e.g.

- Proportion of cook stoves in operation after 3 years is approx. 50%.
- Average usage hour of CFL is 3.5 hours/day.

... and also **(iv) The expected variance (or standard deviation)**: Not required if the parameter of interest is a proportion.

- Where do these figures come from?

a) PP's knowledge / experience

b) Other similar studies

c) Pilot studies

Examples of Sample Size Calculation

Required Reliability: 90/10 confidence/precision

- ***Ex1:***
  - ✓ Population: 640,000 cook stoves
  - ✓ Expected proportion in operation = 0.5
    - ➢ *Sample size = 271*
- ***Ex2:***
  - ✓ Population: 420,000 CFLs
  - ✓ Expected usage hour of CFL = 3.5 hours
  - ✓ Standard deviation=2.5 [Variance=6.25]
    - ➢ *Sample size is 138*

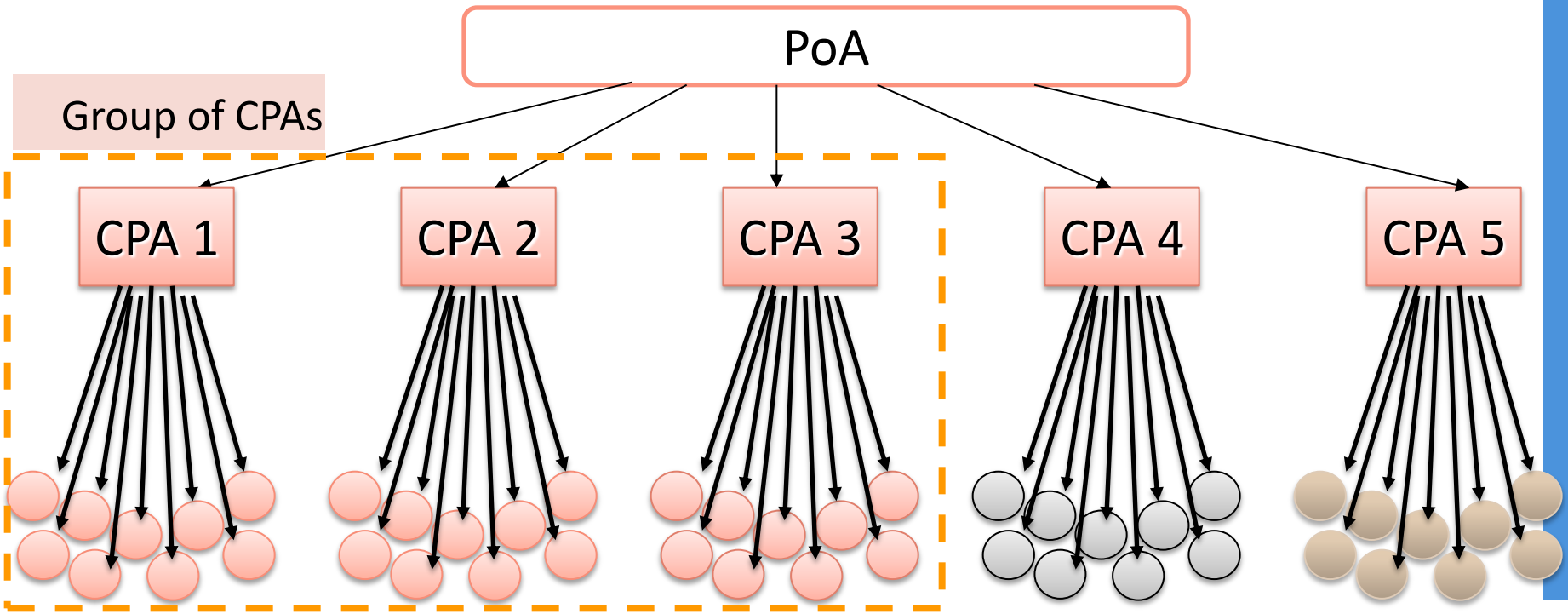
Some Complexities in Sample Size Calculation

1. Sampling designs other than Simple Random Sampling
   - Formula are different for different designs
2. Non-response
   - Increase sample size to account for this or to be on the safe side
3. Unsure of target value / standard deviation
   - Calculate sample size for several scenarios and take largest of them.

Standard deviation	Target mean			
	3.5	4	4.5	5
2	88	68	53	43
2.5	138	106	84	68
3	199	152	120	97

Sampling for a group of CPAs

- Sampling allowed for a group of homogeneous CPAs under a small scale PoA; populations of all CPAs in the group are combined for a single survey



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Section IV: Sampling Requirements

1) Use the following confidence/precision requirements:
   - 90/10 for small-scale;
   - 95/10 for large-scale;
   - Unless specified in the applicable methodology;

2) For precision (i.e. figure of ±10%), use relative percentage terms when parameter of interest is both a proportion and a mean value;
   - ➢ ±10% when average usage of a CFL is 3.5 hours implies that the population parameter is to be within ± 0.35hours.
   - ➢ ±10% when one expects 50% of cook stoves still to be operational means that population value is to be within ± 5%.

Section IV: Sampling Requirements

3) Sampling plan shall be defined at PoA level (PoA-DD)
   - ✓CPA-DD shall contain the sampling plan as defined in PoA-DD

4) Additional data collection is required if PPs fail to achieve the target minimum levels of precision;

5) Confidence/precision relates to the parameters, not ERs;

6) Use the sample mean value for ER calculation, not the lower or upper bound of the confidence interval.

Section VI: Validation and Verification of Sampling plans of Project Activities and PoAs

- Criteria for Validation of Sampling Plans
  - ✓ Adequate to achieve confidence/precision requirements? Reproduce of sample size calculation;
  - ✓ Samples are randomly selected and are representative?

- DOEs may apply sampling when PPs have not applied sampling provided predefined level of assurance is met.

Section VI: Validation and Verification of Sampling plans of Project Activities and PoAs

DOE may use acceptance sampling i.e.:

a) Take a random sample of the PPs sample records;

b) Check, using professional judgment and field visits, the acceptability of the PP records

c) Determine **n:** the size of the sample and **c:** the acceptance number

Acceptable Quality Level (e.g. 1%): Chosen by DOE

Unacceptable Quality Level (e.g. 10%): Chosen by DOE

Producer Risk i.e. chance that the DOE will wrongly reject the PPs records, 10% agreed by the Board

Consumer Risk i.e. chance that the DOE will wrongly accept the PPs records, 10% agreed by the Board

Sampling for DOE validation/verification

		Producers = 5% Consumers = 5%		Producers = 10% Consumers = 10%		Producers = 10% Consumers = 20%	
AQL	UQL	Sample Size (n)	Accept. number (c)	Sample Size (n)	Accept. number (c)	Sample Size (n)	Accept. number (c)
1%	10%	61	2	38	1	29	1
1%	15%	30	1	25	1	10	0
1%	20%	22	1	18	1	8	0
0.5%	10%	46	1	38	1	16	0
0.5%	15%	30	1	15	0	10	0
0.5%	20%	22	1	11	0	8	0

New

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Thank you for your attention

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