

Project Developer Forum input on materiality

Preamble

In the current version of the “Draft Clean Development Mechanism Project Standard” published in conjunction with annotated agenda to EB63, section 12.8.4.1 “Temporary deviations from the registered monitoring plan or applied methodology” details steps to be followed in the event the project participants are unable to monitor or present verifiable data to support monitoring. This text is the subject of extensive feedback to the EB from the Project Developer Forum. We wish to bring to SBSTA’s attention the fact that if the text is accepted as is, it will significantly complicate the application of the concept of materiality as defined in this submission. In the draft Project Standard, DOEs are being instructed to discount CERs by setting un-monitored or un-verified baseline sources of GHG to zero for the duration of the period, and un-monitored or un-verified project sources of GHG to 100% of equipment capacity for the duration of the period in question. This is a gross over-simplification of the process which fails to recognize the existence of other useful data which professional and experienced auditors can use and seriously undermines the environmental integrity of the CDM by invalidating the basic principle that CERs = baseline emissions – project emissions - leakage. Whilst the procedures will allow PPs to request the submission of a request for deviation, DOEs are likely to take a very conservative view of the situation and discount the emission reductions. In addition, this approach raises a serious concern over equipment that has a wide range of operation such as a flare – if operated at full capacity, project emissions from a flare could cancel out a large proportion of emission reductions for a project. The text is also problematical because there is no such thing as a registered monitoring plan, rather it is a registered PDD which contains a monitoring plan.

To complicate issues further, paragraph 227 b) v) of the current version of the Validation and Verification Standard, published with the annotated Agenda to EB63 instructs DOEs to apply standard auditing techniques including on-site assessment involving “An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters”. This text acknowledges the need to identify and correct missing data but provides no guidance to DOEs as to what is acceptable and what is not acceptable, and seems to contradict the requirements Project Standard.

Before reaching a conclusion on materiality, SBSTA should study the latest documentation associated with the Project Standard, the Validation and Verification Standard and the Project Cycle Procedure.

1. Whether the concept of materiality can be applied in the context of the CDM

The Project Developer Forum believes that the concept of materiality should be applied to the CDM. There is an extensive list of advantages which arise from applying the concept of materiality which

also equate to disadvantages and create problems for the process of data verification in the absence of materiality. These are explained below.

As the discussion below highlights, the kinds of locations where missing data are likely to be most frequent are exactly the kinds of areas where we should be encouraging CDM projects – in under-developed sectors of the economy, in rural locations and in places where for example, the supply of electricity is not constant and where experienced staff are not available. This guidance in the draft Project Standard will unfairly penalize CDM projects and handicap the development of investment and capacity.

The application of Materiality as described in this submission will not only provide a fairer means of dealing with missing data, but it will also provide the secretariat with a means of analyzing what kinds of projects and what aspects of the monitoring methodologies prove difficult to monitor, which in turn can lead to an improvement in the overall quality and environmental integrity of the CDM.

The PD-Forum believes that there has been considerable misunderstanding around the concept of materiality, what it means and how it is applied. In order to understand the advantages of materiality, it is first necessary to clarify some of these misconceptions and misunderstandings and provide some clear examples of how it would be applied in practice.

1.1. What is materiality?

Materiality is a transparent process for addressing situations where data collection procedures have failed and estimated values are used in their place. Such failures are commonplace throughout measurement systems. Gaps in datasets are generated by a wide variety of events such as power cuts, voltage fluctuations, meter failures, physical loss of data, operator errors, meters going out of calibration etc. Some of these events are beyond the control of all but the most sophisticated metering systems. They may be relatively common in measurement systems installed in certain types of CDM project activities. When such events occur, operators use back-up measurement systems if they are available. Sometimes these are specified in approved monitoring plans, for example, renewable energy systems would usually have back up meters installed because they need to know how much power they have exported to the grid for invoicing purposes. If such back-up systems are not available, it is normal practice to estimate the missing data based on either the average or the lowest (or highest) values recorded in a period before and after the event. The auditor checks that such procedures are reasonable by corroborating the estimated values with other information such as levels of activity.

A materiality threshold provides the auditor with a process for declaring when too much of the dataset has not been collected in accordance with the defined monitoring plan.

Materiality helps an auditor perform the audit efficiently. The auditor can plan to spend most time on the largest sources and correspondingly less time on smaller sources because a potential error in the large sources will have a greater impact on the result, If the auditor can establish that 95% of

the dataset is free of error, misstatement or omission, then the remaining 5% needs to be reviewed with less stringency. That is NOT to say that any errors in the remaining 5% can go un-corrected. For very small sources which are not otherwise classified as *de minimis* (for example, diesel consumption associated with periodic testing in back up gensets), the auditor may be able to come to a conclusion that these are so small that they can be accepted at face value.

Materiality is NOT a process whereby an auditor ignores small errors. Any error which an auditor finds shall be corrected. Materiality is used when errors cannot be corrected because there is no way of knowing the exact value.

Materiality does not mean a departure from conservativeness. The principle of conservativeness must be addressed through the methodology – for example the default values or calculation processes applied. Auditors should NOT be left to make their own decisions about conservativeness in the face of missing data, as is currently often the case. Auditors should use their professional judgment, whilst on-site, to determine whether steps taken to estimate missing data values are conservative and realistic; applying materiality thresholds will then indicate whether the estimated data compromises the overall result. The materiality calculation can be performed in a conservative manner, as detailed below.

The consequence of a materiality threshold is that the auditor can confirm whether they have arrived at an opinion, such as the number of CERs generated by a project, based on a dataset in which less than X% of the data MAY be misstated. For example, if a threshold of 5% is applied, this means that 95% or more of the entire data set was free of misstatement, omission or error and 5% or less of the dataset was compromised in some way. The compromised data has been estimated using the best available information in the auditor's professional judgment. There could be some over or underestimate of CERs associated with this compromised data. The size and nature of the error is unknown – if it was known, it could be corrected. The threshold is used to decide when the potential error becomes unacceptable.

In the case of CERs, these are typically derived from three calculated values – baseline emissions, project emissions and leakage emissions. Each of these three values is made up of a number of sources as defined in the methodology. Together these sources represent 100% of the data necessary to determine CERs. Potential errors, misstatements or omissions in any of these sources of data contribute in aggregate to the materiality calculation. The aggregation of potential errors is important because when replacing missing data with an estimate, it is not known whether the estimate is above or below the true value. Aggregating the values is therefore conservative because it addresses the situation where all errors could combine to increase (or decrease) the number of CERs requested.

Materiality is expressed as the aggregate value of data which may be compromised (the numerator) divided by the total value of data (the denominator), in percent.

The numerator is calculated as the aggregate value of baseline emissions, project emissions and leakage emissions which may include potential misstatements, errors or omissions.

The denominator can be calculated in one of two ways:

- 1) As the total aggregated value of baseline emissions, project emissions and leakage emissions or
- 2) As the number of CERs (which is the sum of baseline emissions, project emissions and leakage).

Neither option is right or wrong but option 1 is preferable because it provides a full representation of the data set.

For example, an auditor is verifying a monitoring report for one year's energy efficiency activities, which states that Baseline emissions = 1,010,000, Project emissions = 1,000,000, Leakage emissions = 0 and CERs = 10,000. The auditor finds that for a period of 438 hours out of the year, the meter for baseline data malfunctioned and the missing data has been estimated by the operator based on the average of readings before and after. The auditor determines that this is the most appropriate source of information based on the fact that the plant continued normal operations throughout the period in question. The amount of baseline emissions which have potentially been misstated (the numerator) is calculated as

$$(438 \text{ hours} / 8760 \text{ hours}) * 1,010,000 = 50,500.$$

The impact of the options for calculating the denominator is as follows:

	Option 1	Option 2
Denominator	2,010,000	10,000
Materiality value	2.4%	500%

This example illustrates that option 1 is a more practical approach.

1.2. Worked example of the application of materiality to a verification exercise

An auditor is verifying 1 year's data for a coal mine methane project which has installed new pumps to extract methane and generators and flares to generate power and abate un-utilized methane. The description has been simplified and numbers rounded to serve as an example. The baseline emissions comprise two sources – the untreated methane and emissions from grid electricity. The project emissions comprise CO₂ from methane destruction, electricity use for the pumps drawn from the grid and fossil fuels used to run ancillary equipment and ignite the flares. There is no leakage.

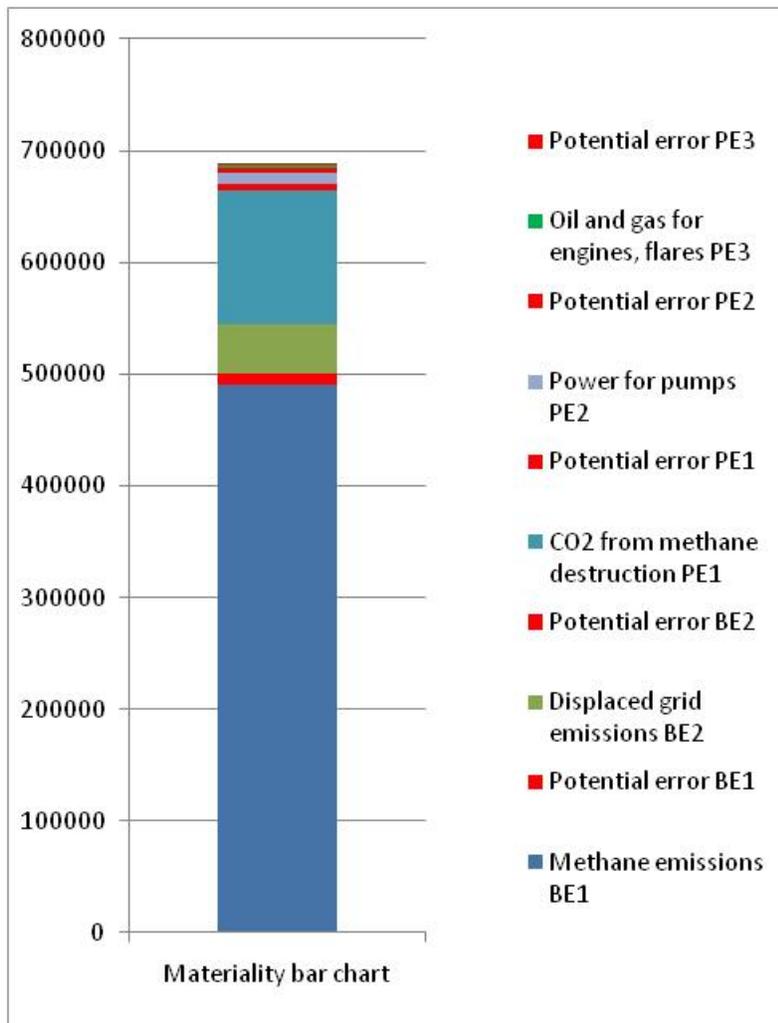
At the end of the audit, the auditor provides the following summary of his findings. These findings show:

- 1) the reported values for each source identified in the methodology
- 2) the value which has been verified as complete and free of errors, omissions or misstatement and;
- 3) the estimated value of data which may contain a potential error, omission or misstatement.

The Summary Notes briefly explain the problem associated with the data. The auditor has accepted the operator's method of estimating the missing data. At the end of the table, the materiality calculation shows what percentage of data is considered to contain potential error, misstatement or omission, calculated using option 1 above. This value would be tested against a materiality threshold.

Categories	Source	Monitoring Report	Audited values	Potential misstatement	Summary Notes
Baseline	Methane emissions BE1	500000	490000	10000	Methanometer failed for 175 hours
	Displaced grid emissions BE2	45000	45000	0	
	n/a	0		0	
	n/a	0		0	
Project	n/a	0		0	
	CO2 from methane destruction PE1	125000	120000	5000	Meter jammed for 350 hours
	Power for pumps PE2	15000	10000	5000	Total meter failure on 1 of 3 pumps
	Oil and gas for engines, flares PE3	2037	2000	37	Unverifiable hand written receipts
Leakage	n/a	0		0	
	n/a	0		0	
	n/a	0		0	
Aggregate		687037		20037	
CER		402963			
% of Data which may contain error, misstatement or omission				2.92%	

Materiality Bar chart for above example

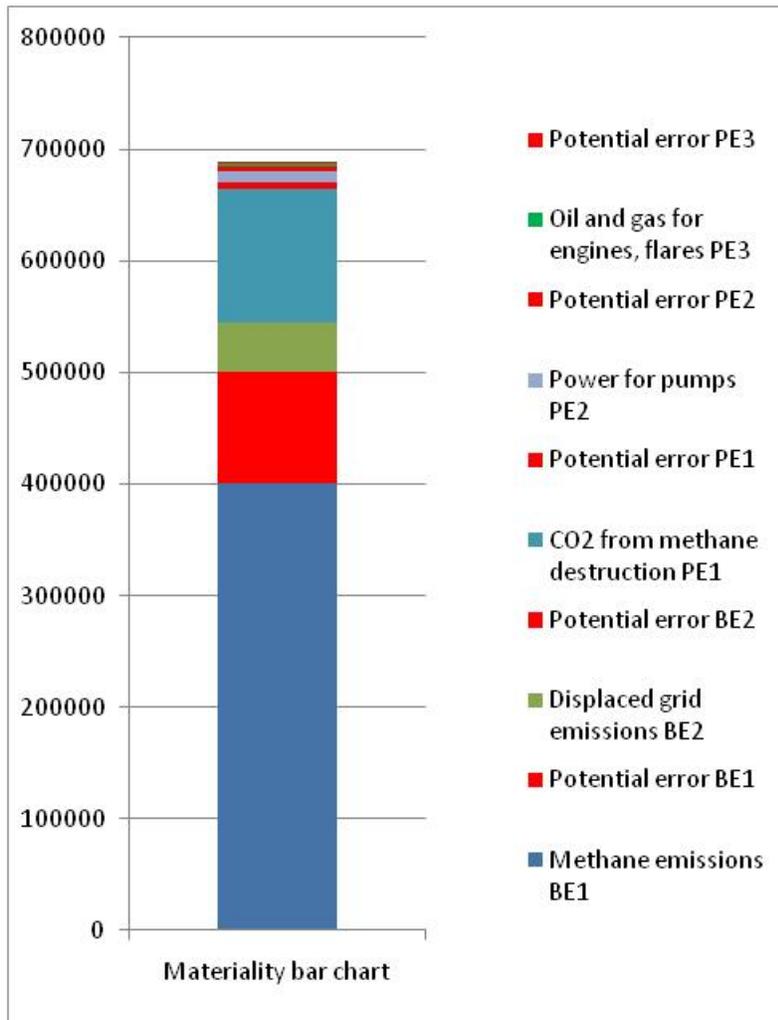


The materiality bar chart provides a graphical representation. The red coloured sections show the proportions of each source which have potential misstatements. This bar chart highlights the fact that in excess of 97% of the data used to determine the CERs was collected in accordance with the monitoring plan.

If a materiality threshold of 5% were to be applied, the auditor would conclude, with a reasonable level of assurance linked to a materiality threshold of 5%, that the project activity has generated 402,963 CERs and that this value is free of material misstatement, omission or error. This is known as an unqualified opinion.

In the event that a 2% threshold were applied, the auditor would not be able to reach an unqualified opinion and would be required to conclude that the claimed number of CERs was not free of material misstatement, omission or error (a qualified opinion). The CDM EB needs to provide guidance on what to do when a request for issuance fails the materiality threshold.

Below is a bar chart for the same example showing a potential misstatement in the baseline methane emissions which results in a materiality calculation of 16.02%



1.3. What to do in the event that a verification exercise fails the materiality threshold

We propose the following approach:

In the event that a materiality threshold is breached, the DOE shall submit a request for deviation and provide a full account of the sources of potential misstatement, error or omission in the monitoring report. The Secretariat and RIT shall review the request and determine whether to accept the request for deviation or not. In doing so, they may chose to consider the project's reporting history, the complexities of the methodology and the logistical challenges associated with the particular project. If they choose to reject the request, they will recommend a new level of emission reductions based on the replacement of missing data with conservative values, until the

level of potential error, misstatement or omission coincides with the applicable materiality threshold. If similar issues have arisen in the past, the PP may consider requesting a revision of the monitoring plan to define practical back up measurement procedures.

1.4. Advantages and disadvantages of materiality

The advantages associated with the application of materiality significantly outweigh the disadvantages.

Materiality provides auditors with a transparent and consistent means of dealing with the problems which arise every day in the implementation of a CDM monitoring plan. Without materiality, DOEs are left to reach their own conclusions of what matters and what does not matter. In the same situation, some DOEs will sub-consciously apply materiality and accept minor errors in data sets whilst others will demand a request for deviation. In some instances, in an effort to promote conservativeness, DOEs insist on substituting missing data with zero readings¹. The Secretariat may or may not notice such differences and if they do, they may lead to further requests for explanations. With materiality, auditors are able to assess the significance of errors, omissions and misstatements during the audit and complete their work much more efficiently and effectively.

In not applying materiality, essential information about the quality of monitoring systems is being lost. If DOEs were required to report on their treatment of errors, omissions and misstatements, the Secretariat could analyze the kinds of projects and situations which cause problems for project participants and verifiers. For example, such analysis may show that some technologies and project types struggle to comply with the existing monitoring methodologies or that the monitoring requirements are prohibitively expensive. This may lead to targeted simplification of monitoring requirements. Conversely, in industrial and large scale renewable energy projects for example, materiality can be used to improve the quality of monitoring by creating a transparent means of assessing when datasets are inadequate.

Other emission trading schemes already apply the concept of materiality and benefit from the efficiencies it introduces. Applying materiality to the CDM would enhance a common approach to monitoring, reporting and verification of emissions data.

Materiality enhances the environmental integrity of the CDM by providing a transparent means of addressing errors, omissions and misstatements. Despite the best efforts of project developers, errors, omissions and misstatement occur and cannot be corrected. Currently, these are missed, ignored, hidden, or addressed via requests for deviation. Such behaviour does not enhance the integrity of the CDM. By providing for materiality assessment, these issues can be reported and addressed in a transparent manner.

¹ This behaviour is commonplace and considered to be conservative but in fact it introduces inconsistencies to the dataset and undermines the basic principles of measuring and calculating emission reductions. Such a decision means that the baseline and project emissions are no longer comparable and the result lacks environmental credibility.

The only disadvantage associated with materiality is its apparent complexity and the fact stakeholders will need to be educated so that they understand that is not a means of ignoring errors.

2. How materiality should be defined in the context of the CDM

There are many definitions of materiality already in use and these are highlighted in the Technical Paper prepared by the Secretariat. It is recommended to use an existing definition which refers to the aggregation of errors. Attempting to cancel out over-estimates and under-estimates of emissions implies that the nature of the error is known, when in fact it is not known. Aggregating the values is conservative.

3. The appropriate thresholds used to define the conditions under which a piece of information should be regarded as material

PD Forum proposes that in the first instance, the CDM EB apply a single threshold of 5% materiality to all requests for issuance with a view to reviewing thresholds not later than one year after the introduction of materiality based on information reported by DOEs relating to the materiality of potential errors, omissions or misstatements. The rationale for this is as follows:

- a) At present there is no knowledge of the magnitude of potential errors, omissions or misstatements and there is a risk that introducing materiality in conjunction with inappropriate thresholds could result in increased delays in issuance.
- b) Matching thresholds to size or number of CERs is not ideal because projects with relatively large levels of CERs can also have very complex monitoring methodologies or involve distributed activities which present logistical challenges to complete data collection (eg light bulb or cook stove projects).
- c) Matching thresholds to methodologies could become extremely cumbersome
- d) Matching thresholds to large scale and small scale also risks mis-classifying projects are small / large scale does not equate to simple / complex.
- e) Ultimately, it may appropriate to have two or three thresholds applied to broad categories of methodologies, but such a classification would best be made when some experience has been gained.

4. The areas to which the concept of materiality should be applied

Materiality is most easily and transparently applied to data verification. The most obvious application is to verification and issuance and the PD Forum recommends that efforts are focused on this area initially.

There are significant elements of the validation process which also include data verification. It is worth noting that the existing sensitivity analysis applied to the determination of financial additionality is effectively an ex ante materiality exercise, informing auditors and the EB of the potential importance of

each parameter (i.e. if increasing or decreasing a parameter by 10% alters the outcome of the additionality assessment, then the DOE applies increased scrutiny to that value). The PD Forum recommends that the application of materiality to validation is investigated via a CDM EB Call for input after materiality has been applied to verification.

5. The relation, as well as the differences between, uncertainty and materiality

Uncertainty is a statistical principle associated with a measurement instrument or a measurement system (comprising multiple instruments). Statistical formulae exist to calculate the combined uncertainty of a measurement system and are widely applied outside CDM. The concept is also applied in AM0009 the approved CDM methodology for avoided gas flaring. Uncertainty can be considered as a measure of the quality of a reading from a single instrument or a system. If the uncertainty is within the “quality specification” then it is normal practice that the reading is accepted at face value. If the uncertainty fails the quality specification (i.e. if an instrument or group of instruments is not sufficiently accurate) it may be considered a non-compliance with an eligibility criterion. This is a potentially serious event.

If adequate instrumentation has been installed but has not been correctly calibrated, for example, the potential misstatement would be addressed via the materiality calculation. If the meter in question was out of calibration for so long that the materiality threshold is breached, then a request for deviation and correction may be appropriate.

This approach is not currently feasible in the CDM because the uncertainty requirements (quality specifications) are not consistently defined within and between methodologies. In this respect, the EU ETS Monitoring and Reporting Guidelines (EU ETS MRG) provide the best example. The EU ETS MRG specifies the parameters which are to be measured in order to calculate emissions from the defined sources and the overall levels of uncertainty which must be met depending on the size of emissions. Operators are then left to design and operate their own measurement systems which are verified by independent third parties (many of whom are also DOEs).

Uncertainty “thresholds” or tiers may be applied to projects of different sizes. Such uncertainty tiers are NOT to be confused with materiality thresholds. The numbers can be of the same magnitude but they do not have the same application or consequences.

Meeting the uncertainty specification is thus a mandatory requirement of the scheme whilst potential errors, omissions or misstatements are addressed via materiality.

It is recommended that such an approach is adopted within the CDM, as this will improve the overall environmental integrity of the system and help to promote a common and better quality approach to Monitoring, Reporting and Verification.

Draft text on materiality

[The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, Recalling the provisions of Articles 3 and 12 of the Kyoto Protocol, Recalling decision 3/CMP.6,

Recognizing that applying the concept of materiality could simplify processes but should not adversely affect environmental integrity,

Noting that the concept of materiality is already applied to some extent in approved baseline and monitoring methodologies and in the assessment of projects,

1. *Decides* that the concept of materiality should be applied in a consistent manner under the clean development mechanism;

2. *Defines* material information as a piece of information whose omission or misstatement, or erroneous reporting, could change a decision by the Executive Board of the clean development mechanism;

3. *Decides* that the scope of materiality covers verification, by designated operational entities, the Executive Board of the clean development mechanism and its support structure, with a view to possibly broadening the scope at a later date;

Option 1:

4. *Also decides* that information related to a clean development mechanism project shall be considered material if its omission, misstatement or erroneous reporting might lead, at an aggregated level, to an overestimation of the total emission reductions [or removals] achieved by a clean development mechanism project activity equal to or higher than:

(a) [X1] [0.5] per cent of the emission reductions [or removals] for project activities achieving a total emission reduction [or removal] of more than [Y] [500,000] tonnes of carbon dioxide equivalent per year;

(b) [X2] [2] per cent of the emission reductions [or removals] for large-scale project activities achieving a total emission reduction [or removal] of [Y] [500,000] tonnes of carbon dioxide equivalent per year or less;

(c) [X3] [5] per cent of the emission reductions [or removals] for small-scale project activities other than projects covered under paragraph 4(d) below;

(d) [X4] [10] per cent of the emission reductions [or removals] for the type of project activities that are referred to in decision 3/CMP.6, paragraph 38.

X1, X2, X3 and X4 shall be set at 5% for an initial trial period.

5. *Also decides* that the emission reduction thresholds and the materiality thresholds shall be reviewed by the Executive Board of the clean development mechanism based on data reported by designated operational entities no later than one year after their implementation;

6. *Decides* that the designated operational entity conducting the verification shall provide a verification opinion with a reasonable level of assurance linked to the materiality thresholds;

7. *Requests* the Executive Board of the clean development mechanism:

(a) To implement the concept of materiality, adhering to the principles established in paragraphs 1–5 above, and to report to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, at its eighth session, on the experiences gained with the implementation of the concept;

(b) To increase its interaction with designated operational entities in order to facilitate a uniform interpretation and application of the concept of materiality by developing guidance, inter alia, on how to calculate the thresholds and on what should be done if the materiality thresholds are surpassed, with the overall view of increasing transparency and efficiency and reducing costs;

(c) To address the issue of uncertainties of measurements in baseline and monitoring methodologies, so that these types of uncertainties do not need to be considered in addressing materiality;

8. *Also invites* the Executive Board of the clean development mechanism to develop guidance on de minimis sources, which are defined as sources of emissions that do not require monitoring and verification.]

