CDM: Proposed new methodology expert form (version 04)

(To be used by methodology experts providing desk review for a proposed new methodology)

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Related F-CDM-NM document ID number	NM0103

Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of CDM-NMB and CDM-NMM and of their application in sections A to E of the draft CDM-PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgments are substantiated.

A. Evaluation of the proposed new methodologies by desk reviewers:

I. Evaluation of the proposed new baseline methodology:

Title of new baseline methodology:>> Baseline methodology for district heating rehabilitation, possibly reducing use of in house devices

Abbreviations:
PA - project activity
BLS – baseline scenario
DHS – district heating system
ER – emission reduction
RK1 and PK2 – names of DHSs in Andijan
IHD – individual heating device
DSM – demand-side management

i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):

>> The proposed methodology can be used if the following conditions apply:

- The project rehabilitates an existing district heating system (DHS), which may be deteriorating and therefore be reducing heating services to DHS customers.
- No capacity increase: The capacity (according to name plate, in MW) of the boilerhouse(s) to be installed with the project activity and from which CERs are claimed is not higher than the sum of the capacities (according to name plates, in MW) of the boilerhouse(s) and other heating devices (if applicable) that form the baseline situation. A project with expanded capacity cannot claim CERs under this methodology for the capacity that exceeds the old capacity.
- Sufficient information is available about local conditions that impact the operation, use and development of the DHS, about the use of IHD (if applicable), and about technical and investment alternatives to the existing DHS.
- The methodology is not applicable for new DHS in locations where previously no DHS was operating.

ii. Strengths and weaknesses of the methodology:

>>The strengths:

- A combination of a cost analysis and a barrier analysis, that leads to appropriate approach for selection of baseline scenario.

>> The weaknesses:

- The NMB don't adequately estimate project ER overestimating it potentially considerably.
- The methodology is based on a lot of data which are hardly available: heat delivery efficiency and boiler house efficiency of DHS, as well as power and NG consumption of IHDs.
- Passports of DHS equipment and construction and exploitation norms of heat networks may be considered as legislative and normative documents. Then improvement of efficiencies of DHS equipment and heat networks up to there values from passport data or norms may not be considered as additional.
- Insufficient guidance on accounting of DSM at DHS.
- Insufficient guidance in NMB how to estimate baseline heat delivered, especially by IHD, fuel consumption etc. In PDD there is some (insufficient) judgment about heat demand but in NMB it is addressed insufficiently.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>

- The combination of both (cost analysis and a barrier analysis) seems the most appropriate to determine the baseline scenario. The proposed methodology allows using one of these two options.

b. Major changes:>>

- The additionality tests in NMB must be added by specific test on the correspondence of data to passports of DHS equipment and construction and exploitation norms of heat networks that may be considered as legislative and normative documents. Then improvement of efficiencies of DHS equipment and heat networks up to there values from passport data or norms may not be considered as additional.
- The equation (8) (page 12, NMB) must be corrected to adequately estimate CDM project ER.
- It must be clear indicated that the only documented data on heat delivery efficiency and boiler house efficiency of DHS, as well as power and NG consumption of IHDs may be used in calculations. In case of absence of documented figures, their values may not be low than requests of corresponding norms (like Construction norms and regulations, Heat networks, SNiP 2.04.07-86, Moscow, 1988, in Russian or similar local norms) and passport data of DHS equipment. Any undocumented estimations of these efficiencies may not be used in calculations of ER.

II. Evaluation of the proposed new monitoring methodology:

Title of new monitoring methodology: >>Monitoring methodology for district heating rehabilitation, possibly reducing use of in house devices

i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability):

>> Applicable to broad range of DHS projects

ii. Strengths and weaknesses of the methodology:

>>Strengths

Straightforward and robust methodology

>>Weaknesses:

1. Insufficient guidance on monitoring of supplied heat in BLS and PA. (ID 7, 13).
2. ID 8, 15, 19 allow use of estimated values, which may be not conservative.

iii. Any changes needed to improve the methodology:

a. Minor changes:>>
– Explain how DSM measures should be accounted for

b. Major changes:>>
- Improve weaknesses 1,2.

B. Details of the evaluation of the proposed new methodology by the desk reviewer:

I. Proposed new baseline methodology *(specify title here):* >> Baseline methodology for district heating rehabilitation, possibly reducing use of in house devices

(1) Short description of the methodology, including an assessment of which approach from paragraph 48 of the CDM modalities and procedures was used:

a) Describe the methodology:

>>The methodology comprises 7 steps:

1. Identification of practical alternatives to the projects technology

This list should include all technical alternatives to the projects heating technology that could be implemented in place of the projects technology taking into account the country's and sector's specific conditions.

2. Determination of the baseline technology

The determination of the baseline technology can be done in two alternative ways:
Option 1: Barrier analysis or
Option 2: Economic/financial investment analysis.

3. Definition of emission factors for saved fuels

The CO_2 emission factors of the considered fossil fuels (oil products and natural gas) for the baseline and the project technology are based preferably on local data on net calorific value and carbon content available from the fuel suppliers and/or official statistics. In absence of local data, default values from the IPCC guidelines should be used.

4. Definition of emission factors for saved electricity

The present baseline methodology provides two options for the determination of the emission factor for saved electricity, EF_{el}, (in tCO_2/MWh), depending on the amount of saved electricity. The following (a) For power saving above 15 GWh per annum, and (b) For power savings up to 15 GWh per annum.

5. Determination of emission factors for heating technologies

If heat is only provided by one source the emission factors established in steps 4 or 5 are identical to the emission factors for technologies. If heat within one technology is provided by different sources than a weighted average of the source specific emission factors calculated in steps 4 or 5 must be calculated. The weights are given by the share of the different heat sources in total heat supply.

6. Emission reductions calculation and projection

The emission reduction ER_y (in tCO_2) by the project activity during a given year y is the difference in the emission factor of the baseline technology EF_{BLS} and of the project technology EF_{PA}, multiplied by the actual energy $HEAT_{PA\_BLS\text{-}HH,y}$ delivered to the baseline customers by the CDM project[3] in year y.

7. Additionality test (Additionality tools)

Additionality is demonstrated based on the "Tool for the demonstration and assessment of additionality" as amended by the CDM Executive Board.

b) State the approach selected:

>> 48b: Emission from a technology that represents an economically attractive course of action, taking into account barriers to investment.

c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide your expert judgment on the appropriateness of the selected approach to the project category:

>> The arguments of methodology are a reasonable motivation for choosing 48 b. The selected approach is appropriate because it is best suited to reflect the decision making-process of an economically rational DHS operator. At the same time, the approach adequately allows to account for the observed situations at the existing

DHS and at the apartments of residential consumers, which represent the natural starting point for baseline considerations for this project type.

(2) Basis for determining the baseline scenario:

a) State whether the documentation explains how the baseline scenario is to be chosen and identified:

>> Yes, see steps 1-7 listed above.

b) State the basic underlying rationale for algorithms/formulae used (e.g. marginal vs. average basis) (see also section 4 below):

"The determination of the baseline technology can be done in two alternative ways": barrier analysis or economic/financial investment analysis (p.5, NMB). It is indicated that "in cases were reliable data on prices and costs are available and normal market conditions prevail an investment analysis should be done to identify the least cost option" (p.6, NMB). That leaves possibility to select BLS only on the base of Option 1 (Barrier analysis). It seems the only barrier analysis does not give clear and transparent guidance on how the baseline should be selected, but leaves too much room for interpretation. The combination of both (cost analysis and a barrier analysis) seems the most appropriate to determine the baseline scenario. Lack of normal market conditions and subsidized heat tariff seems not a reason not to do cost analysis.

As a demonstration of NMB the barrier analysis is selected as "more appropriate to determine the baseline scenario than an investment analysis" (p. 8, PDD).

c) State whether the documentation explains how, through the use of the methodology, it can be demonstrated that a project activity is additional and therefore not the baseline scenario. If so, what are the tools provided by the project participants?

>> Yes. Tools provided are a combination of (i) financial analysis of heat supply costs, (ii) barrier analysis, and (iii) demonstration that the project is not common practice in the host country or region. The additionality is demonstrated by performing a cost analysis for all plausible alternatives and subsequently a barrier analysis on the financially most attractive options and the project itself.

d) State whether the basis for determining the baseline scenario and for assessing additionality is appropriate and adequate:

>> Yes, the approach is appropriate for this project type. It allows identifying the most likely baseline scenario in a transparent and plausible way. However, some reservations regarding the detailed development of the baseline scenario apply.

The moot point of NMB is described below. Passports of DHS equipment and construction and exploitation norms of heat networks may be considered as legislative and normative documents. Then improvement of efficiencies of DHS equipment and heat networks up to there values from passport data or norms may not be considered as additional. For example if we improve water leakage from existing dramatic situation (50% leakage) up to the requested by norms level – we only remove mismanagement and this activities are not additional. But if we build modern heat networks (for example with preinsulated tubes) and increase normative heat delivery efficiency – these activities are additional. The same situation is with boilers: if boiler efficiency according passport is 85% but in reality 72%, its improvement up 85% is not additional but higher than 85% is additional. Of course this approach to additionality is quite strict and may lead to very conservative ER estimations but in my opinion it corresponds well to DHS projects with lack of reliable operational data.

(3) Assessment of the description of the proposed methodology and its applicability

a) State whether the methodology has been described in an adequate manner:

>> The methodology is described in an adequate manner; however several assumptions are not conservative.

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A - E of the draft CDM-PDD and submitted along with CDM-NMB):

>> In principle the proposed methodology is appropriate for the project activity.

c) State whether the application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.

>> The methodology could result in a baseline scenario because it doesn't take into account DSM.

Please explain:

>>Real life in many former USSR countries demonstrates at least quite often changes of old windows on new plastic ones even in old buildings. In some cases there are municipality programs on renovation of roofs, windows and additional insulation of walls. This allows us to expect permanent influence of DSM on heat consumption of buildings.

(4) Assessment of algorithms/formulae and type of data needed:

a) State whether the description of the methodology includes algorithms and generic formulae that can be applied to other potential project activities (if not, the proposed new methodology will be considered as a project-specific methodology):

>> Yes, the algorithms and formulae used for identifying the baseline scenario and for estimating associated emissions levels are applicable to other, similar projects. Formula (8) needs to be corrected.

b) Explain the spatial scope of data used to determine the baseline and whether the scope is appropriate:

>> Spatial scope of data is the district heating system, municipality, country or region, depending on data type. The scope is appropriate.

c) Explain the vintage of data used (in relation to the duration of the project crediting period) and whether the vintage of data is appropriate, indicating the period covered by the data:

>> It is said (p.15, NMB) that the baseline should use the latest available data, but without specifying a vintage. Such in draft DPP some data presented for 2000 and 2001 years some only for 2001 and most once without indication of year. It'll be logical to request from project developers to present main data influencing on development of BLS for the last 3 available years.

(5) Definition of the project boundary related to the baseline methodology:

a) State how the project boundary is defined in terms of:

i) Gases and sources

>> CO2 from DHS, IHD, and power plants supplying the grid

ii) Physical delineation

>> The DHS (or the parts of the DHS that are rehabilitated under the project), plus power plants supplying the grid.

b) Indicate whether this project boundary is appropriate:

>> Yes, appropriate.

(6) Key assumptions/parameters (including emission factors and activity levels) and data sources:

a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and

explain:

>> Baseline emissions are based on measured or estimated fuel consumption, heating system efficiencies, net calorific values, oxidation factors and supplied heat for district heating system and for individual fossil fuelled heaters. Emissions from power consumption in DHS and for electric individual heaters are calculated from measurements or estimates of electricity consumptions and a grid carbon emission factor (AM0002 or small scale grid methodology. Project emissions are based on monitored fuel use, efficiencies and emission factors.

Problematic assumption is:
– (implicit) Use of IHD is assumed to drop to zero in the project scenario.

b) State whether the key assumptions are arrived at in a transparent manner:

>> Key assumptions required to identify baseline scenario are mostly transparent. For example, energy prices are assumed to stay flat in the cost comparison of baseline scenario candidates, which is ok in combination with the sensitivity analysis.
With regard to the determination of the baseline emissions level, the methodology provides very little guidance. As a result, the methodology invites to derive key parameters such as baseline heat demand and fuel mix in an intransparent way.

c) Give your expert judgment on whether the assumptions/parameters are adequate:

>>"The emission reduction ER_y (in tCO_2) by the project activity during a given year y is the difference in the emission factor of the baseline technology EF_{BLS} and of the project technology EF_{PA}, multiplied by the actual energy $HEAT_{PA\_BLS\text{-}HH,y}$ delivered to the baseline customers by the CDM project[3] in year y. Baseline customers are those that are physically connected to a rehabilitated (part) of the DHS and were physically connected to the old district heating system before the start of the project activity. The limitation on baseline households ensures that an increase in coverage (compared with the baseline) by the improved DHS is not included in ER calculations.

(8) $ER_{y} = (EF_{BLS} - EF_{PA,y}) * HEAT_{PA\_BLS\text{-}HH,y}$

$HEAT_{PA\_BLS\text{-}HH,y}$ is the amount of heat (in GJ) delivered in year y to customers that
(a) are physically connected to a rehabilitated (part) of the DHS in the year y, and
(b) were physically connected to the old district heating system before the start of the project activity.
(Only heat delivered to customers fulfilling both conditions (a) and (b) is considered in $HEAT_{PA\_BLS\text{-}HH,y}$.)"
(p.12, NMB).

For the case when heat (in GJ) delivered in year y to customers ($HEAT_{PA\_BLS\text{-}HH,y}$) in PA is higher than heat (in GJ) delivered in year y to customers in BLS the formula (8) will overestimate ER_{y}. Such in draft PDD (Table 5, p.16, PDD) it is estimated that to have 16 C temperature in the apartments (which is estimated as baseline situation) we need to provide 702 MJ/m^{2}a and it leads to 587'434 GJ of heat delivered to RK1&RK2 (Table 6, page 17, draft PDD). It is estimated in PA scenario that new DHS will provide 593'040 GJ of heat delivered to RK1&RK2 in 2008-2014 years (Table 9, page 40, praft PDD) – practically the same as in BLS (587'434 GJ). But that means that we'll provide in PA the same service as in BLS and provide only 16 C temperature inside apartments instead of requested 18 C (page 4, Construction norms and regulations, Heat networks, SNiP 2.04.07-86, Moscow, 1988, in Russian) or 18,5 C (GOST of USSR, 1962).

If the new DHS will provide heat on the base of SNiP requests (18 C) – we need to supply 908 MJ/m^{2}a (Table 5, p.16, PDD) - 22.6% higher than for 16 C. Then if we'll use formula (8) for $HEAT_{PA\_BLS\text{-}HH,y}$ corresponding to 18 C apartments temperature we'll overestimate ER_{y} (on 22.6% in above example). If average room temperature with new DHS will be 20 C (as predicted on p. 17 of draft PDD) we need to supply 1059 MJ/m^{2}a (Table 5, p.16, PDD) - 33.7% higher than for 16 C. Then if we'll use formula (8) for $HEAT_{PA\_BLS\text{-}HH,y}$ corresponding to 20 C apartments temperature we'll overestimate ER_{y} (on 33.7% in above example). To guarantee conservative approach we need at least to use in formula (8) lowest from provided heat in PA and BLS. It will be more conservative but also not completely correct such as in reality new DHS most likely will provide heat on the base of at least 908 MJ/m^{2}a to guaranty 18 C apartment temperature.

The most conservative, general and in my opinion the most correct formula for emission reduction in this case is:

$ER_y = EF_{BLS} * HEAT_{BLS,y} - EF_{PA,y} * HEAT_{PA,y}$

Provided heat in BLS ($HEAT_{BLS,y}$) and in PA ($HEAT_{PA,y}$) may be different ($HEAT_{BLS,y} < HEAT_{PA,y}$). That will lead to comparison of BLS and PA with different quality of heat service (insufficient in BLS and sufficient in PA). The proposed in NM0103 methodology "equalizes" provided heat in BLS and PA. In my opinion it is more correct to compare real emission in PA and in BLS even with unequal service quality. The request of the equal heated area in compared BLS and PA is correct and absolutely necessary.

The other group of questions is connected with individual heaters.
"Data on the consumption of natural gas and electricity by DHS customers was not available. The operators of the NG and electricity grids provided some data on overall consumption in Andijan. However, the on-site visit revealed that most of the electricity meters in the buildings seem to be bypassed, and the pressure in the natural gas distribution network is often so low (especially during cold periods) that metering is heavily distorted. As a result, the data from grid operators cannot be used to estimate baseline emissions." (p.16, PDD).

In such conditions real data on NG and power consumption by IHD are absent and ER from these devices may not be included in project boundaries. The proposed in BLS approach when 16 C temperature are expected in all apartments and 22% of heat for this are supplied from DHS, 39% are provided from IHD on NG and 39% from IHD on power seems voluntary and non conservative. Some critical points to this approach:

- It is mentioned that "apartments near boiler-houses receive enough heat" (p.15, PDD);
- There is not evident that all apartments have IHDs,
- There is not evident shares of provided heat between DHS and IHDs;
- There is not evident that temperature in all apartments is 16 C;
- Heating by power is not so cheap and at least not all residents may allow themselves to have 16 C temperatures by power heating.
- IHD on NG costs 150-250$ without installation and perhaps not all residents may buy them.

In my opinion only if documented figures on power and NG consumption may be presented for IHDs ER from them may be accounted in the project boundaries. In other case this ER can not be included in BLS emission. In line with the Marrakesh Accords and the CDM Glossary approved by the CDM Executive Board, effects outside the project boundaries that are not measurable are not considered and leakage is therefore not taken into account.

d) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement):

- Data on fuel consumption, efficiency and heat supplied by existing district heating system (DHS): This Data was obtained from DHS operator, site visit and interviews with customers, expert judgement, IPCC.
- Data on fuel/electricity consumption, efficiency and heat supplied by existing in house devices (IHD): Data from fuel/electricity suppliers, site visit and interviews with customers, expert judgement, energy balance building heat model, IPCC.
- Data on fuel consumption, efficiency and heat supplied by project activity DHS: Data from DHS operator, fuel supplier, IPCC.

One of the most critical point of the methodology how to estimate correctly amount of heat (in GJ) delivered in year *y* to customers in BLS $(HEAT_{BLS,y})$ and total efficiency of heat supply ($\eta_{DHS,HFO}$ and $\eta_{DHS,NG}$).

For example, according to PDD (p.13) "heat supply to customers is not metered. Therefore, a systematic and conservative estimate of the overall efficiency of the existing DHS has been made, based on a site visit, interviews with the Chief Technical Engineer of ADHC and customers and based on experience with similar

deteriorated DHS in other countries".

e) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:

>> Such critical for ER calculations parameters as heat supplied to customers ($HEAT_{BLS,y}$), efficiency of heat supply (η_{DHS}), may be used in the calculations only on the base of documents, measurements, norms, passport data, exploitation/ "regime" cards etc. In this connection seems overestimated all kind of heat losses and underestimated all kind of efficiencies. Such efficiency 73% of existing boilerhouse consuming NG (page 50, draft PDD) doesn't correspond typical former USSR countries practice. Such Russian boilers KVGM-50 of alike capacity (50 Gcal/a equal to 58 MW) which are very typical for existing DHS of former USSR countries have passport data of boiler efficiency 92-92,5 %. In Ukrainian practice this efficiency is measured by special Energy Conservation Inspection once per three years and documented in special test protocol (signed and stamped by Inspection). By the way efficiency 73% is not corresponding to other data from the draft PDD. Such total fuel consumption of RK1+RK2 is 203788+377980 = 581768 GJ/a (page 49 for year 2001, draft PDD) and output of boiler house is 231239 + 275392 = 506631 GJ/a (p 50, PDD). Then boiler house efficiency is 506631/ 581768 = 87 % (not 73% as it is used for calculations).

The similar situation is with heat losses in heat networks. There must be known for DHS "planed" and reported figure of these heat losses which is originally calculated in construction design document of heat network and must be regularly measured, corrected and documented by DH company. On the base of this figure tariff on the delivered to apartments heat are calculated and approved by municipality. These financial documents must exist and are strongly recommended as a source of documented data on heat delivered to consumers. These documented figures must be known to DH company and municipality. Typical heat losses in Ukrainian heat network (also not the best in the world and not reconstructed mainly from Soviet times) including losses in building basements are 13 - 30 %. Water losses through the leakages are also regulated by norms and may reach some percents (not 50% as in draft PDD). Then general efficiency of heat supply in 20.2 % in BLS (p.50, PDD) seems underestimated considerably.

f) State possible data gaps:

>> In case of absence of documented figures on heat delivery efficiency, boiler house efficiency their values may not be low than requests of corresponding norms (like Construction norms and regulations, Heat networks, SNiP 2.04.07-86, Moscow, 1988, in Russian or similar local norms) and passport data of DHS equipment. Any undocumented estimations of these efficiencies may not be used in calculations of ER.

(7) Assessment of uncertainties:

a) State whether the methodology includes an assessment of uncertainties regarding:

i) The basis for determining the baseline scenario:

>> The assessment of uncertainties does not make reference to the uncertainties involved in the determination of the baseline scenario.

ii) Algorithms/formulae:

>> No

iii) Key assumptions:

>> No

iv) Data:

>> No

b) State whether the uncertainties presented are reasonable:

>> The proponent doesn't identify adequately which factors could lead to a wrong choice of the baseline scenario or an overestimation of the emission reductions.

(8) Leakage:

a) State how the baseline methodology addresses any potential leakage due to the project activity:

>> No leakage is identified.

b) Indicate whether the treatment for leakage is appropriate and adequate:

>> The proponent states that emissions associated with production and transportation of fuels are (1) not under the control of project participants and (2) will be lower in the project situation compared to the baseline due to increased efficiency. This argumentation is appropriate.

(9) Transparency and "conservativeness":

a) Indicate whether the baseline methodology was developed in a transparent way:

>> The methodology is in general developed in a transparent way. But the methodology invites to derive key parameters such as baseline heat demand and fuel mix in an intransparent way.

b) State whether the baseline methodology is conservative:

>> The methodology is not enough conservative for the reasons mentioned in section 6.

(10) Potential strengths and weaknesses of the proposed baseline methodology *(please explain)*:

>> See section A.1.ii above and explanations in section 6.

(11) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account *(please explain)*:

>>National and sectoral policies are taking into account through the combination of the cost analyses and a barrier analysis.

(12) Applicability of the proposed methodology across project types and regions *(please indicate)*:

>>The baseline methodology is applicable for DHS rehabilitation projects and not restricted to specific regions.

(13) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>> "Construction norms and regulations. Heat networks", SNiP 2.04.07-86, Moscow, 1988, in Russian

b) Indicate any further comments:

>>N/A

II. Proposed new monitoring methodology *(specify title here):* >>: Monitoring methodology for district heating rehabilitation, possibly reducing use of in house devices

In respect of the proposed new monitoring methodology, evaluate each section of CDM-NMM to the draft CDM-PDD. Please provide your comments section by section:

(1) Brief description of new methodology:

Describe new methodology:

>>The emissions from a specified mix of technologies in the baseline (in tCO2 per GJ of heat delivered to customers by old DHS and IHDs) are calculated based on measured or estimated fuel consumption, heating system efficiencies, net calorific values, oxidation factors and supplied heat for district heating system and for individual fossil fuelled heaters. Emissions from power consumption in DHS and for electric individual heaters are calculated from measurements or estimates of electricity consumptions and a grid carbon emission factor.

The emissions from a specified project technology (in tCO2 per GJ of heat delivered to customers by rehabilitated DHS) are calculated based on monitored fuel use, efficiencies and emission factors.

Emission reductions are the difference of specific baseline and project emission factors (in tCO2/GJ) multiplied by the annual amount of heat delivered to "baseline customers". Baseline customers are those that are physically connected to a rehabilitated (part) of the DHS and were physically connected to the old district heating system before the start of the project activity.

(2) Key assumptions/parameters:

a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:

>>Assumptions:

1. Use of IHD by residents is negligible in the project scenario.
2. Supplied heat in BLS and PA (ID 7, 13) will be measured and monitored for 100% of apartments.

b) State whether the key assumptions are arrived at in a transparent manner:

The assumptions are derived in transparent manner but they are not completely conservative.

c) Give your expert judgement on whether the assumptions/parameters are adequate:

>> Not completely. If heat provided by new DHS will be insufficient the use of IHDs will take place that will increase project ER due to higher EF of electrical IHDs than new DHS.

It is mentioned that heat delivered will be measured and 100% monitored both in BLS and PA. It is recommended for this to measure the difference between water entering and exiting the Apartments and the temperature and amount of hot tap water supplied. (p.5, 8, NMM). In most cases of soviet time buildings it is practically impossible on the level of apartments/ rooms. There is not one pipe for water entering and exiting the Apartments, there is al least one pipe per each room and kitchen. Exiting pipe from one apartment is an entering pipe to other apartment. That's why the only realistic possibility for the first crediting period is to measure the difference between water entering and exiting and the temperature and amount of hot tap water supplied for whole building. To calculate heat supplied to apartments we need to know as well water flow rate of inside building heat network. Then we need to include measurement not only amount of hot tap water supplied but also amount of hot water supplied for heating.
The other alternative (perhaps cheaper) is to select some amount of representative apartments (say of street cleaners in each big building) in which sealed room temperature thermometers are installed and which data will be monitored regularly (say weekly). Heat supplied to the apartments may be calculated on the base of these temperatures (Table 5, p.16, PDD).

(3) Data sources and data quality:

a) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement):

>>
ID 1-7, 9-14, 16-18 are measurable;
ID 8, 15, 19 are measurable or estimated;
ID 16 is calculated.

b) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:

>>Not completely. ID 8, 15, 19 allow use of estimated values, which may be not conservative

It is mentioned that fossil fuel(s) consumption in old DHS or IHDs may be "documented estimate" (p. 7, MM). It leaves possibility to overestimate these fuels consumption. Any kind of estimations must be avoided in

monitoring of fuel consumption. The only reliable documented data are applicable.

It is mentioned that heat provided by IHDs (in MWh) may be estimated (p. 9, MM). It leaves possibility to overestimate this IHD power consumption. Any kind of estimations must be avoided in monitoring of IHD power consumption. Only reliable and documented data may be basic for ER calculation. The only reliable documented data are applicable.
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c) S*tate possible data gaps:*
>> Data gaps:

MM must be updated to adequately monitor supplied heat to apartments in BLS and PA (ID 7, 13) (see (2) c).

(4) Assessment of the description of the proposed methodology and its applicability:

a) State whether the proposed methodology has been described in an adequate manner:

>>The monitoring methodology in general does adequately described how the data are to be monitored.

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A - E of the draft CDM-PDD and submitted along with CDM-NMM):

>>The methodology is in principle appropriate for the first crediting period of the referred proposed project, taking into account the suggested changes, as the methodology is specifically developed for the proposed project and the project context.

c) State whether this proposed monitoring methodology is compatible with the proposed baseline methodology described in CDM-NMB of the draft CDM-PDD:

>>Yes

(5) Leakage *(please elaborate, if appropriate)***:**

>>The methodology does not foresee any monitoring of leakage parameters, which is adequate.

(6) Quality assurance and control procedures *(please explain)***:**

>>QA/QC procedures are required for all measured variables (ID 1-19), which is appropriate. It is however not explained what the QA/QC procedures should include and who will be responsible QA/QC. This leaves too much room for interpretation and does not guarantee a proper QA/QC procedure.

(7) Potential strengths and weaknesses of the proposed monitoring methodology *(please explain)***:**

Strengths:
– Straightforward and robust methodology. If all ID data will be reliable and documented the methodology will correctly monitor project situation.

Weaknesses:
1. Insufficient guidance on monitoring of supplied heat in BLS and PA. (ID 7, 13).

It is mentioned that heat delivered will be measured and 100% monitored both in BLS and PA. It is recommended for this to measure the difference between water entering and exiting the Apartments and the temperature and amount of hot tap water supplied. (p.5, 8, NMM). In most cases of soviet time buildings it is practically impossible on the level of apartments/ rooms. There is not one pipe for water entering and exiting the Apartments, there is al least one pipe per each room and kitchen. Exiting pipe from one apartment is an entering pipe to other apartment. That's why the only realistic possibility for the first crediting period is to

measure the difference between water entering and exiting and the temperature and amount of hot tap water supplied for whole building. To calculate heat supplied to apartments we need to know as well water flow rate of inside building heat network. Then we need to include measurement not only amount of hot tap water supplied but also amount of hot water supplied for heating.
The other alternative (perhaps cheaper) is to select some amount of representative apartments (say of street cleaners in each big building) in which sealed room temperature thermometers are installed and which data will be monitored regularly (say weekly). Heat supplied to the apartments may be calculated on the base of these temperatures (Table 5, p.16, PDD).

2. ID 8, 15, 19 allow use of estimated values, which may be not conservative.
It is mentioned that fossil fuel(s) consumption in old DHS or individual heaters (IHD) may be "documented estimate" (p. 7, NMM). It leaves possibility to overestimate these fuels consumption. Any kind of estimations must be avoided in monitoring of fuel consumption. The only reliable documented data are applicable.

It is mentioned that heat provided by IHDs (in MWh) may be estimated (p. 9, MM). It leaves possibility to overestimate this IHD power consumption. Any kind of estimations must be avoided in monitoring of IHD power consumption. Only reliable and documented data may be basic for ER calculation. The only reliable documented data are applicable.

(8) Applicability of the proposed methodology across project types and regions *(please indicate)***:**

>>Applicable to broad range of DHS projects. The monitoring methodology is applicable for DHS rehabilitation projects and not restricted to specific regions.

(9) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM web site) has been used by you in evaluating this methodology. If so, please provide specific references:

>>N/A

b) Indicate any further comments:

>>N/A

Signature of desk reviewer …  ……..

Date: 27/ May / 2005

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