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# National CDM criteria, baseline methodologies and case studies for Uzbekistan


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**Abstract**

The Clean Development Mechanism of the Kyoto Protocol could create a great chance for developing countries to profit from projects that reduce greenhouse gas emissions and improve the economic and environmental situation in the host country. The project cycle for the CDM differs from a usual investment project due to the need to develop a baseline for the calculation of emission reductions, registration by a national CDM body and monitoring and verification of the emission reduction by an independent entity. Before a project can be registered, its eligibility has to be checked. This means that it has to fulfil the international and national CDM criteria. We suggest national criteria concerning the CDM component, adherence to national policy goals, technological aspects, attractiveness for investor and host enterprise as well as avoidance of negative externalities. A set of sustainable development indicators is proposed for Uzbekistan. We then look at each step of project preparation and concentrate on baseline determination, using small hydropower stations in the Uzbek irrigation system as case studies. Determination of system boundaries, leakage and the lifetime of the projects are assessed. Different benchmarks for the Uzbek electricity sector are calculated. We calculate the economic attractiveness of three hydro power stations to determine whether the investment is really additional, using different discount rates and electricity price scenarios. In all scenarios we find positive costs, making the projects additional.

**Zusammenfassung**

Der Mechanismus für umweltverträgliche Entwicklung (CDM) des Kyoto-Protokolls eröffnet für Entwicklungsländer eine große Chance, von Projekten zu profitieren, die gleichzeitig Treibhausgasemissionen senken und die Lage der Ökonomie und Umwelt im Gastland verbessern. Der Projektzyklus eines CDM-Projekts unterscheidet sich von einer herkömmlichen Investition dadurch, dass ein Referenzfall für die Berechnung der Emissionsverringerung aufgestellt werden muss, das Projekt bei einer nationalen CDM-Agentur angemeldet werden muss und eine Überprüfung und unabhängige Kontrolle der Emissionsverringerung erforderlich ist. Bevor ein Projekt angemeldet werden kann, muss geprüft werden, ob es überhaupt zulässig ist. Das bedeutet, das es die internationalen und nationalen CDM-Kriterien erfüllen muss. Wir schlagen nationale Kriterien bezüglich der CDM-Komponente, der Förderung nationaler Politikziele, technologischer Aspekte, Attraktivität für Investor und Gastfirma sowie Vermeidung negativer Externalitäten für Usbekistan vor. Wir betrachten dann die verschiedenen

Schritte der Projektvorbereitung und konzentrieren uns dabei auf die Referenzfallbestimmung anhand von Kleinwasserkraftwerken im usbekischen Bewässerungssystem. Die Bestimmung der Systemgrenzen, indirekter Effekte und der Lebensdauer der Projekte werden diskutiert. Unterschiedliche Standard-Emissionsfaktoren für den usbekischen Stromsektor werden berechnet. Wir analysieren die ökonomische Attraktivität dreier Kleinwasserkraftwerke, um zu bestimmen, ob eine derartige Investition wirklich zusätzlich ist. Dabei werden unterschiedliche Diskontierungsraten und Strompreisentwicklungen berücksichtigt. In allen Szenarien kommen wir zu positiven Kosten, was bedeutet, dass die Investitionen zusätzlich wären.

# 1. INTRODUCTION

Whether global climate warming is reality or just scientific speculations has been one of the most hotly discussed questions in the 20th century. Opinions were often extreme, and even scientists did not have any common point of view on causes and consequences of global warming. A major issue was if the warming forecasted and already observed is human-induced or that it is due to natural variability related to solar activity. However, the third assessment report of the Intergovernmental Panel on Climate Change (IPCC 2001) strengthens the case for anthropogenic climate change by dismissing the solar theory outright. Thus climate policy becomes a pressing need and nations of the world will have to spend huge amounts of money on programmes of mitigating climate change and alleviating its consequences.

Historically, industrialised countries made the largest contribution to the growth of GHG concentration in the atmosphere. Regarding the right of equity, the UN Framework Convention on Climate Change of 1992 (UNFCCC) has determined a differentiated responsibilities of the Parties to the Convention (Article 4.1) and obliged developed countries (the so-called Annex 1 countries) to provide financial support to Non-Annex 1 countries for fulfilling their commitments including transfer of technologies (Article 4.3). In 1997 the Kyoto Protocol fixed legally binding emissions targets for Annex 1 countries and introduced flexibility mechanisms (the so-called Kyoto Mechanisms). The Clean Development Mechanisms (CDM) allows crediting emission reductions from projects in developing countries while Joint Implementation projects are limited to Annex 1 countries. Moreover, Annex 1 countries may engage in international emissions trading.

Unfortunately, for the time being, a major part of money provided by industrialised countries in accordance with their commitments under the Convention is invested in preparation of National Communications and National Action Plans on Climate Change in developing countries. However, the developed plans are generally a list of good intentions, and not concrete actions. Even if they are developed with quite thorough economic analysis it is more likely that they will be fulfilled only partly because of lack of real funds for financing proposed measures. The situation may change with introduction of the Kyoto mechanisms when Annex 1 countries will be interested in putting money in implementation of projects aimed at emission reduction in other countries.

The Protocol has not entered into force yet and detailed rules and guidelines for the CDM have not yet been agreed. Thus the investors from the developed countries hesitate to put up money in CDM projects. However, in this situation, it is necessary to keep in mind that only a small part of these rules, especially methodological, are contentious. A basic body of guideline has been discussed for a long times during climate negotiations and is consensual. It can be used by non-Annex 1 counties to create a CDM infrastructure at a national level. Besides that, a part of the rules used under conventional investment project document development can be taken for a CDM project too.

The project cycle of a conventional investment project consist of a series of standard stages including: (i) selection of project proposals, (ii) design of project document, (iii) approval of project by investor and host country, (iv) project's realisation and, finally, evaluation of the project outputs. Financial and economical effectiveness is an indispensable condition of this project. Besides, a comfortable investment climate, the political and economical sustainability of host country and reliability of the partners for project implementation are very important issues for an investor.

Let us consider a project cycle for CDM projects and emphasise the difference between CDM and “ordinary” investment projects. As it follows from Table 1, a baseline (a particular reference scenario) validation by CDM national body, project registration by CDM national and international body, CERs validation and their certification by CDM Executive Board under the UNFCCC will be added to the standard procedures.

**Table 1: Project cycle of CDM project**

| Traditional project cycle | New procedures at project cycle |
|---|---|
| *Selection of project proposal* | Eligibility criteria for CDM project |
| *Design of project document* | Setting baseline |
| *Project implementation* | National CDM body creation |
| *Monitoring, audit of project* | Monitoring and audit of GHG emission reduction |
| **New procedures for CDM projects** | **Main actions** |
| *Project document and baseline validation by independent entity and national CDM body* | National CDM body should approve project document and project contract including financial scheme and the proceeds sharing at a national level. Independent entity should validate a CDM project including baseline. |
| *Project registration by national CDM body and Executive Board for CDM* | Project entering into national and international database. |
| *Verification and certification of GHG emission reduction by independent entity* | Independent entity should verify and certify emission reduction obtained by CDM project. |
| *Transfer of CERs to investor* | Validation of CERs by Executive Board, issuing CERs and transfer to investor. |

Many recommendations have been discussed in the literature how a project could be made more attractive for potential investors. Proposed approaches should be applied for CDM project design too. However, it is necessary to remember that only the projects met the series of specific terms indicated in 12 of the Kyoto Protocol can be financed under this mechanism. Other words, *proposed projects should be eligible for CDM.*

All procedures connected with CDM project realisation can be divided into three stages (pre-appraisal, appraisal and implemented). Under *pre-appraisal stage*, project proponent should: (i) formulate a project concept (including background, purpose, brief description, outputs), (ii) find an investor, and (iii) implement a baseline study. *Appraisal stage* includes development of project document (PD) and validation of PD including baseline by host country, investor and independent entity designated by CDM Executive Board under the UNFCCC. *The stage of implementation* comprises physical realisation of the project, monitoring and reporting, certification and verification, credits sharing.

The most part of publications, workshops have been devoting to problem of baseline. There are some handbook and guidelines for baseline setting. But, as usual, these papers are intended for more training purposes than for people from industry being potential CDM project proponents. This paper tries to develop more practical guidelines and is meant for a wide audience interested in CDM project development.

## 2. INITIAL SCREENING OF CDM PROJECTS

Participation in the Clean Development Mechanisms demands strict compliance with some provisions following from the Kyoto Protocol. Otherwise, GHG emission reduction generated with a project will not be certified. A base for decision-making – whether the proposed project meets the requirements of CDM – will be eligibility criteria. It supposes that each host-country should set up national eligibility criteria in line with international criteria. Project proponents should submit a CDM project conception to national CDM body which will carry out initial screening of the project.

This chart is designed to give clear understanding the common rules which will be use under initial screening of CDM projects. Apparently, national eligibility criteria and sustainable development indices will be adjusted taking domestic circumstances into consideration. But largest part of them will be the same in different countries.

### 2.1 Eligibility criteria for CDM projects

We can only speak about a preliminary list of the CDM eligibility criteria since interpretation of many key clauses is open under current formulation of the Kyoto Protocol. Full clarity will be hopefully achieved at COP 6b in 2001 when the rules, procedures and modalities under the Kyoto mechanisms will be adopted. But even under a further stalling of the process, it is likely that a CDM-like provision will be implemented under any future climate regime.

Nevertheless, a proposed project can be implemented under CDM if it meets to the provisions of Article 12 of the Kyoto Protocol (international requirements) and meets the priorities of national policy (national requirements).

### 2.1.1 International criteria (Article 12 of the Kyoto Protocol)

- *for non-Annex 1 Parties* - to assist in achieving sustainable development and in contributing to the ultimate objective of the Convention;

- *for Annex 1 Parties* - to assist in achieving compliance with their quantified binding commitments under the Kyoto Protocol;

- to ensure real, measurable and long-term benefits related to the mitigation of climate change;

- to produce GHG reductions that would not have occurred in the absence of certified project activities;

- participation in the project has to be voluntary and approved by each Party involved;

- to implement the certification of GHG emission reduction through operational entities to be designated by the Conference of the Parties;

- to meet the criterion of the CDM executive board which will be created under the Climate Convention Secretariat.

International requirements will be further detailed after COP 6b.

### 2.1.2 National criteria

A list of possible national criteria is given in Table 2. For user's comfort, proposed criteria were united in six components which are recommended to be updated periodically along getting experience within CDM project implementation. At this stage, under preparation of project proposals, it is necessary to take into account, as far as possible, all the components indicated in table 2 since they will be taken as a base for project approval. The priority of separated components, obviously, will change depending on the project type.

**Table 2:National eligibility criteria for CDM projects**

| **Component** | **Criteria** | **Evaluation (yes, not)** |
|---|---|---|
| CDM component | 1) A project is promoting sustainable development of the host country<br>2) There is demonstrable element of additionality (financial, environmental) in a project<br>3) A project is aiming at capacity building for local experts and organisations | |
| National policy | 1) A project meets the priorities of current economical and investment policy<br>2) A project meets the priorities of current environmental policy<br>3) A project meets the priorities of current social policy<br>4) A project meets to the requirements of other international conventions, agreements | |
| Technological aspects | 1) A project is using modern technologies and materials<br>2) A project is replicable.<br>3) A project meets the priorities of national technological development<br>4) A project has low technological risks | |
| Attractiveness for investor | 1) Specific cost of CERs is not higher than the average market price<br>2) There is a reliable partner for project implementation | |
| Attractiveness for project promoter | 1) Modern technologies and know-how should be received under project realisation<br>2) Project is promoting staff qualification | |
| Externalities | 1) Negative externalities are absent under project realisation<br>2) Project implementation is resulting in positive externalities<br>3) Project is improving supply for goods and services | |

***CDM component of a project:*** An essential condition under CDM project implementation is that the project activity should be promoting sustainable development of a country. In depending on scale, the project proponents should consider compliance of the project outputs to the objectives of sustainable development on different levels – state – specific economy sector – enterprise.

A crucial issue will be the assessment of project additionality. It is necessary to examine *both environmental and investment additionality*. But, in this connection, it follows to note that there is not full clarity in this issue. At the present time, this is more open, under discussion issue which should be resolved at COP 6b. For example, one of the recommendations from the international expert closed workshop (Amsterdam, 17-19 January, 2000) was to "restrict test to environmental additionality only".

Not all projects that appear to have positive GHG effects are additional. (For example, the measures aimed at emission reduction and financed from governmental budget.). Project proponents should reasonably demonstrate *that emission reductions are additional to the "business as usual" or baseline scenario.* The specific measures which lead to any emission reductions must be identifiable and documented. It follows to show that *a project would not be financed by other national or international resources.*

Project could demonstrate additionality through financial analyses showing that the creation of carbon offset is likely to involve additional incurred costs compared with those of comparable baseline activities. Often, a GHG emission reduction project will either provide a lower rate of return, or will involve higher risk than is conventional to that type of investment within the sector. One can also use *barrier approach* for additionality demonstration.

A project should assist to create a CDM infrastructure involving institutional and legal frameworks, setting up electronic database and informational system, establishment of capacity building for national experts and consultants.

***National policy:*** Project proponents should take into account: (i) projections of national development at a macro economical level, (ii) economical and social development plans in a specific sector of economy, (iii) existing environmental regulation and also potential of organisations engaging in project activity. The project components should not contradict other international agreements and conventions adopted by a state.

***Technical aspects:*** The technical policy priorities both at a governmental level and in specific sector of economy should be considered under project design. A project should be aiming at application of modern technologies and, materials and know-how on a national market. Preference should be given to technologies, materials promoting technical progress of a state. Project implementation should carry low technological risks. The projects with multiplied potential will have additional advantage.

***Attractiveness of project:*** A project should be attractive both for the proponent and for investor. Both sides will be interested in receiving of the proceeds. Investors will be interested in receiving CERs on low price as compared to the market average, in a comfortable investment climate and with reliability of the partners in the host country. The proponent will be interested in receiving modern technologies, know-how, and promotion of staff qualification.

***Externalities:*** Eligibility assessment of CDM project must also include indirect effects derived from the implementation of the project. Project must not cause negative externalities – unwanted side effects which counter the overall benefits of the project. The positive side effects of project implementation also should be highlighted, for example, improving of energy supply, decrease of fuel consumption, reduction of toxic compound emissions, decrease of waste, environmental pollution payment and etc. The analyses should include GHG and non-GHG related externalities.

## 2.2 Assessment of sustainable development

The quantifiable assessment of the CDM project influence on sustainable development is a difficult methodological problem since there are not undisputed quantifiable indicators which can be checked, monitored and verified over time. Therefore, for an early stage of drawing up the mechanisms of the CDM project implementation, the national priorities for sustainable development are expediently adopted as a base for project selection. Compliance of proposed CDM project with above mentioned indices will be checked within analyses of baseline and additionality.

**Table 3: List of Sustainable Development Indices**

| Type | Indices |
|---|---|
| **ECONOMICAL** | • introduction of environmentally sound technologies, "know-how"<br>• energy-efficiency improvement and cost reduction<br>• attraction of foreign investments for sector development<br>• perfection of tariff policy<br>• high/efficient resource utilisation<br>• skill upgradeability |
| Social | • local employment potential<br>• additional income for farmers and local businessmen<br>• improvement of conditions for local schools, hospitals and etc.<br>• improvement of business culture<br>• intellectual capacity building of population<br>• improvement of population health |
| Environmental | • rational use of land and water resources<br>• abatement of air pollution both toxic compounds and GHG<br>• use of renewable energy (wind, water, solar)<br>• decrease of payment for environmental pollution<br>• reduction of toxic waste under production |

## 3. PRE-APPRAISAL STAGE

A well-formulated project proposal is powerful help in search for an investor. The pre-appraisal stage includes the following steps: (i) formulation of project concept, (ii) search of investor, and (iii) baseline study including additionality definition and calculation of incremental costs. The baseline study is the most difficult and costly part of this stage and should be carried out under the financial and methodological support of investor.

### 3.1 Project conception

#### 3.1.1 Category of projects that can be considered as CDM

Theoretically, any activity aimed at GHG emission reduction could be considered as a CDM project. But, this emission reduction should be "additional to any that would occur in the absence of the certified project activities" and bring "real, measurable, and long-term benefits related to the mitigation of climate change". For reduction and sequestration GHG, it exists a menu of several hundred technologies. In table 4 the more typical areas for CDM project implementation are given. A decision concerning forestry CDM projects is expected at COP 6b.

**Table 4:Typical areas for CDM project**

| | |
|---|---|
| Energy supply | Fuel switching<br>Renewable energy<br>Refurbishment of existing power generation<br>Introduction of new technologies for power generation including CHP<br>Transmission and distribution losses (primary energy carriers, electricity, heating)<br>Emission reduction at the site of fuel production |
| Energy demand | Replacement of lighting, cooling, heating and transport equipment.<br>Efficient operation of existing equipment. |
| Transport | Reduction in transport demand<br>Modal shift<br>More efficient technologies<br>Fuel switch |
| Waste management | Capture and utilisation of landfill/wastewater emissions |
| Agriculture | Change in land use practices<br>Capture and utilisation of animal waste methane emissions<br>Improved feed to reduce livestock methane emissions |
| Sequestration | Afforestation<br>Reforestation<br>Forest protection<br>Forest management<br>Sequestration in soils |

It would be advisable for CDM project proponents to carry out short marketing research on the existing CDM market both on a domestic and international level. The chosen area should correspond with the goals of national sustainable development and be a part of national strategy of GHG emission reduction.

### 3.1.2 Short description of CDM project

**Background:** Proponents should explain the priority and significance of a proposed CDM project for a country and a sector and should describe national and sectoral basic data concerning the CDM project's objective and GHG emission reduction. It is necessary to show a project's connection with national environmental action plan (NEAP) and national plan of social and economical development. The proponent should briefly analyse the existing experience of current projects which are similar to proposed one. Here input from the national CDM institutions can be helpful.

**Objective**: Proponents should briefly state the main goals of the project and to connect the purposes of a CDM project with national development plans, social, economical, environmental and political strategies.

**Project activity description:** Proponents should describe the main components of a CDM project and show the institutional arrangements for project implementations. The costs for the main project components should be estimated and the terms of CDM project financing should be defined. Proponents should define the key financial, economical, social and ecological benefits and the main restrictions, obstacles and risks of proposed CDM project. Policy and institutional arrangements required for minimisation of the risks should be considered. The presentation of information in the form of layout charts, pictures and maps could be useful under project proposal consideration.

**Outputs:** The assumed outputs of the project should briefly be described.

## 3.2 Funding source for CDM project

Where and on which terms funding source for a CDM project can be found is the key issue for the pre-appraisal stage. Brief descriptions of main international institutions that fund mitigation projects are given below (see also Annex 1).

***The World Bank Prototype Carbon Fund (PCF)*** has been operating since April 2000 and has a volume of 180 million $. The main goal of the PCF is to fund CDM and JI projects. To get financial support from the fund, you have to pass through a number of bureaucratic procedures, the main of them is to prove a component of additionality in the project and relevant validation of baseline. Considering a “grant” nature of assistance and the fact that demand considerably outdistances supply, obtaining a grant from the fund is rather a difficult task. For example, it only funds one project per host country.

A choice of partners for ***AIJ/JI/CDM*** programs implemented in a number of developed countries is also very limited. Generally, European countries cooperate with countries of Eastern Europe, for example, the Scandinavian countries cooperate mainly with the Baltic countries, and Japan cooperates with Asian countries, its traditional partners. And in this case, demand outdistances supply because of limited funding. Participation in the AIJ/JI/CDM programs is more interesting because real projects are funded; a part of costs of the programs is covered from the programs’ budgets.

*Attraction of* ***private capital*** for funding the CDM was indicated in the Kyoto Protocol, Article 12.9 (“private and public entities can participate in acquisition of certified emission reductions”). However, currently this can be more likely referred to good intentions. There are some reasons why, for the time being, *the private companies are not interested in investing money into this kind of transactions*. *Firstly*, in most Annex 1 countries quantitative commitments under the Kyoto Protocol have not been allocated to individual entities; that is why individual private companies are interested in such transactions more theoretically rather than practically. *Secondly,* developing countries are internationally ranked as high-risk countries for investment, and, taking into account uncertainties associated with this new kind of goods (GHG emission reduction units), these risks become considerably higher. *Thirdly*, conditions of game in the emerging carbon market have not been yet determined. Most of private companies still have a cautious attitude towards investment in the CDM and only giant transnational companies like Shell and Chevron are implementing pilot projects with developing countries that are business partners of these countries. Probably, the formation of markets to trade GHG emissions at a national level in a number of developed countries such as the UK and Denmark will advance this process. Already the “grey” market in GHG reduction allows cheap CDM-type projects to sell emission reduction at 1 to 3 $ per ton of carbon.

***Global Environment Facility (GEF)*** is a financial mechanism created under four international agreements, including the UN Framework Convention on Climate

Change. Under the Framework Convention, the GEF's funds are chiefly used for preparation of national communications on climate change, preparation of technical and economic tasks (PDF stage). However, the funding of real full-scale projects aimed at specific actions is cumbersome are CDM projects are not eligible.

### 3.3 Baseline Study

A baseline is a reference scenario aimed to quantify what most likely would occur in the absence of CDM project activities. The overall purpose of the baseline is to demonstrate that emission reductions from a given project are additional to what would otherwise have happened in the host country.

The choice of baseline types depends mostly on the data available in the host country[1]. *Top-down modelling* requires an operational economic/energy model for the host country and high-quality datasets to run it. *Benchmarks* require data on the historical operation of technologies relevant for the project type and/or projections. Pure *project-by-project baselines* need a thorough description of the situation at the project location. A brief description of the different approaches for baselines setting is given in Annex 2 and Annex 3.

A typical baseline study should include the following stages:

- definition of system boundaries
- definition of leakage and externalities
- definition of project lifetime and crediting lifetime
- setting of baseline scenarios
- estimation of environmental and investment additionality
- estimation of incremental costs

1 It is likely that there will be international rules for baseline determination in the medium term. However, so far no decision on such rules has been taken and it is unlikely that COP 6b will do so. Thus, we discuss all possible rules and give recommendations on their application

### 3.3.1 System boundaries

By **system boundaries** notion (geographical, economical) we mean the scope within which project outputs are determined. The degree of aggregation determines system boundaries. System boundaries can be defined at the scale of proposed activity – productive units, enterprise, a number of enterprises and etc. Besides that, there can be different degrees of spatial aggregation (geographical system boundaries).

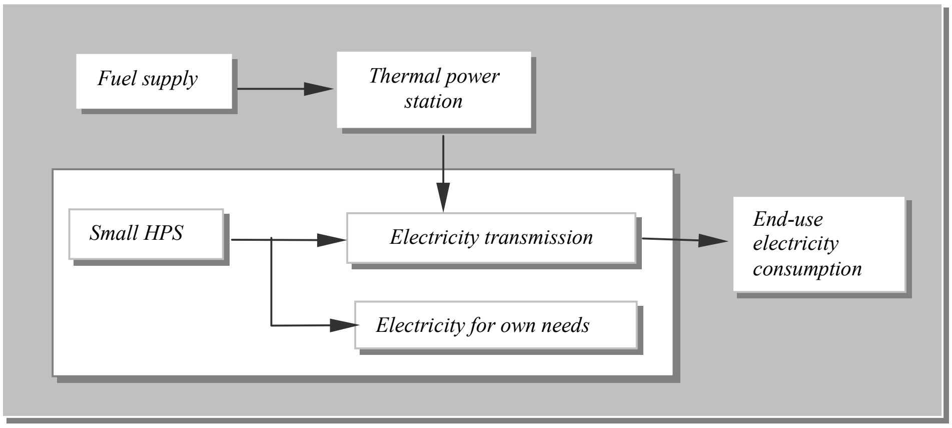
All the emission sources covered by a project's activity should be included in analyses of system boundaries such as:

- emissions generated by combustion of fossil fuel
- emissions released as result of a process or activity
- emissions connected with fuel handling, storage or transportation being controlled by the project

It is recommended to draw the system boundaries in the flow-chart including the project components connected with GHG emission reduction. At that, it is desirable to mark the components which should be replaced, introduced or refurbished.

While in theory a baseline should include the full greenhouse gas impact of a project, some emissions may be so small that their inclusion in the baseline would not significantly affect either its level or its accuracy. For example, although $CH_4$ is emitted in cement manufacture by the direct combustion of fuel used, it makes up less than 0.5 % of GWP-weighted emissions from direct fuel combustion and so should reasonably be omitted from the baseline for the sake of simplicity.

**Fig.1: System boundaries for proposed CDM project**




***Example:*** *Electricity generated by small hydropower systems (HPS) is transmitted to national electricity grid. Annual electricity production by small HPSs (8.3-33.0 GWh) is considerably less than total electricity generation (54000 GWh). The influence of the project on the electricity grid thus is negligible. We therefore propose to limit the project boundary to the HPS. (see Fig. 1).*

### 3.3.2 Leakage

**Leakage** describes indirect emissions that occur outside of the defined system boundaries. Leakage can be positive and negative (i.e. reduction or increase of emission somewhere in other places). For example, if a CDM project uses more power-consuming raw materials such as copper, aluminium, it results in indirect $CO_2$ emission increases in the production processes of these materials (called upstream leakage) or the CDM project produces more energy efficiency materials or products whose use will result in indirect emission reduction at demand side (called downstream leakage).

Project proponent should describe and quantify, if possible, all situations where leakage might occur: p*ositive* – (i) technology spillovers; (ii) cost reduction of technology due to scale effects; (iii) attraction of demand for clean, reliable services: - *negative* – (i) displacing activities that cause emission to another location; (ii) purchasing or contracting services or commodities that lead to emissions and were previously produced or provided on site; (iii) emissions increases through reduction of market prices of services or commodities that leads to higher demand; (iv) changes in the emissions during a life-cycle of a product so that emissions arise in the other stages of life cycle that are not subject to constraints; (iv) lower demand for efficient good/services due to your project (e.g. in the case of DSM).

***Example*****:** *To determine leakage for the proposed small hydropower projects two options can be considered: (1) additional electricity supply in rural areas and (2) replacement of inefficient 'dirty" mobile diesel pumping stations (MDPS) used for water delivery in irrigation system.*
*Option 1. The share of electricity generation by proposed small hydropower stations makes up about 0.01 % of total. Fuel saving and avoided losses under fuel transportation to thermal power station are too small on the scale of national electricity grid that it need not be taken into consideration within calculation of total emission accrued under CDM project implementation.*
*Option 2. Theoretically, other consumers can use the fuel saved under replacement of MDPS to direct networking. But, in this situation, the assessment of emission reduction will be difficult since the data of future use of the saved diesel fuel is uncertain and depends, inter alia, on the existence of demand surplus.*

### 3.3.3 Lifetime of the CDM project

The total number of emissions credits generated by a CDM project will be extremely sensitive to the time during which emissions credits are allowed to accrue. In a CDM project document, three periods of time should be determined – (i) project lifetime, (ii) crediting time and (iii) lifetime of baseline.

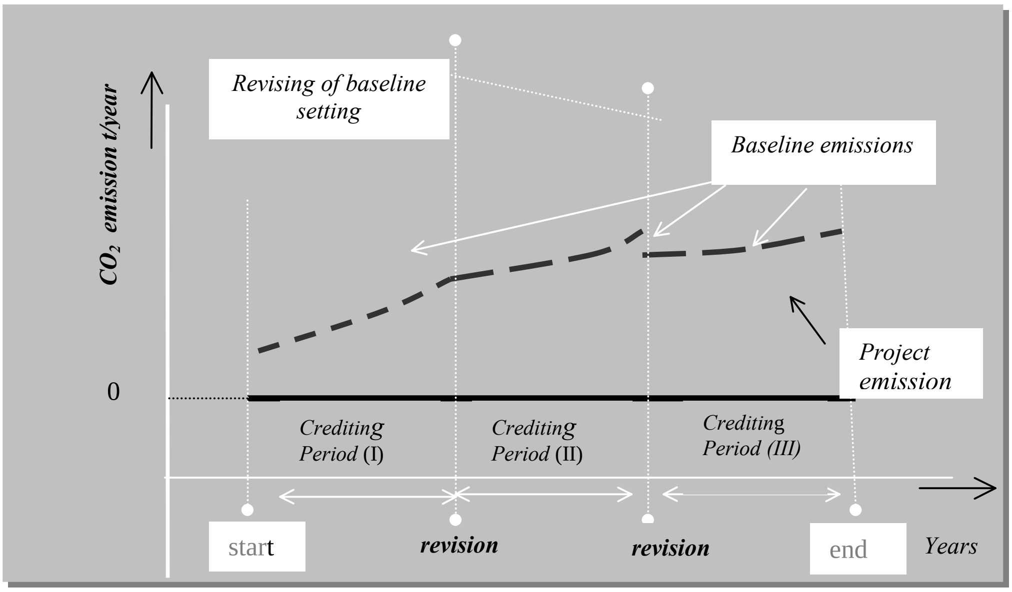
*Project lifetime* – is the period required for CDM project implementation. Theoretically, project lifetime can be the same as the technical lifetime of equipment. Practically, this time is considerably shorter since the time interval of CDM project implementation will be limited to the period for which the equipment can be operated economically. Project lifetime would be established under signing of contract but adjusted due to changing economic circumstances.

*Crediting time* – is a period during which CERs accrue. Crediting time should be defined at the beginning of the project, be approved by the governments of investor and host country and not be changeable during the project implementation. Since both investor and host country are interested in maximising crediting time we propose to establish time limits for crediting time depending on a CDM project category:

- energy efficiency 5 years
- retrofit and renovation 10 years
- new installations (greenfield projects) 15 years
- forestry 50 years

*Baseline lifetime.* There are different possible lifetimes of baseline: (i) “static” – that is fixed at the start of CDM project and remaining fixed during the crediting time; (ii) “dynamic” – that is revised during the crediting time of a CDM project (Fig.2).

**Fig. 2: Dynamic baseline determination**




Two types of baseline revisions exist: (i) announced *ex-ante* revisions (based on policy or economics shift, or due to changes in baseline technology over time, or regularly, e.g. every 5 years); (ii) *ex-post* adjustment for changed activity levels such as changes in the degree of participation, changes in capacity utilisation etc. (ii) is necessary whereas (i) is still subject to political debate.

If not prescribed by UNFCCC rules, the decision concerning a type of baseline lifetime should be also taken under signing of contract.

*Example: In the case of CDM projects connected with new HPS construction, crediting lifetime should not exceed 15 years at the beginning of the project. Revision of the baseline should be carried out every five years.*

### 3.3.4 Setting of baseline scenario

A baseline scenario represents the description of situation without the implementation of CDM project. Project proponents should clearly describe the existing technology, processes or productions, and their most likely future development (taking into consideration technological changes, tariff and regulatory policy, social and population pressure, market barriers and etc.) and associated sources and sinks of GHG emissions. All the assumptions used under description should be explained.

The ultimate aim of baseline setting is to estimate GHG emission reduction of the CDM project. A simplified calculation of the emissions reduction can be carried out by the following equations.

$$\textbf{Project emission} = k_{pr.}\ A_{pr.}\ \textbf{(1)}$$

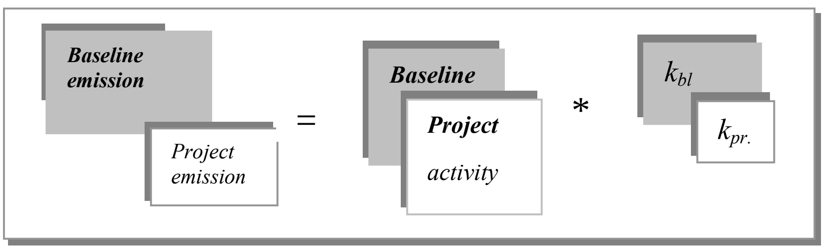
$$\textbf{Baseline emission} = k_{bl}\ A_{bl}\ \textbf{(2)}$$

**Emission reduction = baseline emission – project emission (3)**

where: k – emission rate (factor); A – output (activity) level

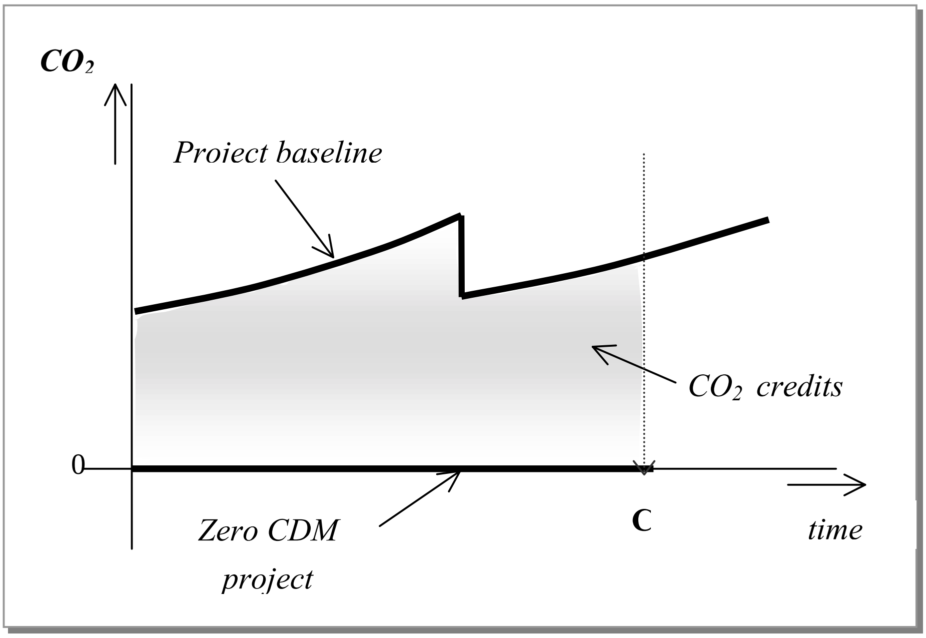
It should be kept in mind that economic outputs (kWh, tons of production, TJ, passenger kilometres and etc.) of both the CDM project and baseline should be equal ($A_{pr}=A_{bl}$). Moreover, we have to compare the same amount of products under calculation of GHG emission reduction. I.e. practically, GHG emission reduction assessment lies in definition emission rate (specific GHG emission per unit of the outputs) for baseline and CDM project (Fig.3).

**Fig. 3: Scheme of emission calculation**



Under implementation of replacement projects, this operation is simple and transparent for verification. But situation is complicated when we should estimate a level of emission reduction for green-field project with zero-emission. As follows from equation 1-3 emission reduction (avoided emission) accrued from CDM project should be equal baseline emission in case of a zero-emission project (Fig. 3).

**Figure 4: Determination of environmental additionality for zero-emission project**




There are two principally different approaches for determination of emission rate – specific project (with using of investment analyses, control group method, scenario analyses) and multi-project (national baseline, benchmarks, technology matrix, default baseline matrix). (See Annex ..).

**Multi-project approach**. The baseline emission rate can be calculated for sector, sub-sector (benchmark), technology (technology matrix, default baseline matrix). It implies that some kind of an aggregation process has been done beforehand. Once defined, a standardised emission rate is approved at a national level by political decision and is used by all project participants in a given country or sector. The lifetime of the standardised baseline is also set by political decision.

The main problem is the choice of aggregation degree – country average, country average of last 5 years, best technology in host country, best technology currently commercial, best available technology. Proponent can consider some options but final decision will be reached under contract signing unless there are UNFCCC rules.

Under definition of sectoral (technology) emission rate, a weighted average is calculated

$$K = \sum_{i=1}^{n} [A] \times \frac{B}{[C]} \quad (1)$$

where A – emission rate for each facility
B – the output for each respective facility
C – output for all facilities

**Specific project baseline**. In this situation, emission rate is determined for specific project. Project proponents should explain:

- the current situation (status quo). Could the status quo be maintained without significant investments, or will large investments inevitably be necessary during the lifetime of the project?
- Existing plans for alternative projects (alternative from the considered project viewpoint)
- Existing development plans and trends (national, regional) based on energy, environmental and other related policies and taking into account requirements under environmental laws.

This baseline is more accurate as compared with multi-project but its setting will increase the transaction costs. Such a baseline can be used for the specific project only.

***Example:*** *In the case of green-field project with zero-emission like proposed small hydropower stations, the crucial issue is what type of emission rate should be used for baseline calculation. In current situation, when there is no clarity concerning rules and guidelines, many different approaches can be chosen. We may consider six different benchmarks to demonstrate a range of possibilities of choice using matrix technique for explanation of proposed baseline. National baseline was excluded from consideration since this approach has more theoretical than practical sense.*

*Under setting baseline A applies a benchmark approach, i.e. it uses a standardised emission rate against which the project is compared. A $CO_2$ emissions rate per kWh, taking into account fuel mix, equipment conditions and level of thermal power station operation is used as sectoral benchmark or benchmark for the national electricity grid.*

*In the case of baseline A1 the project is compared with $CO_2$ emissions from average current generation by all thermal power stations (TPS) and combined heat power stations (CHPP) and concerning baseline A2 with $CO_2$ emissions from the average present generation mix. Six large thermal power stations and three large combined heat power plants produce the largest part of power. The share of electricity produced by combined heat power plants makes up about 8 %. The electricity generated by small hydropower stations replaces electricity generated by the other fuels. The average fuel mix is a measure to describe the emission rate in the absence of the project.*

*Setting of baseline A1 and A2 is simple with regard to data requirements. The approach is quite precise during the early years of the project, but uncertainties increase considerably during crediting time because the fuel mix is expected to change.*

*Data of the Ministry of Energy (the calculation and analyses of technical-economical performances (TEP) of thermal power stations) was used for setting baseline A1. TEP analyses are carried out regularly with issuing quarterly and annual reports. The annual Review of Power Station Operation was used for setting baseline A2.*

*The fuel mix for electricity generation has changed during the last 9 years. In comparison with 1990, the share of natural gas increased from 74.4 in 1990 to 83 % in 1999, accordingly, sectoral benchmarks were reduced from 624.3 $gCO_2/kWh$ in 1990 to 580.8 in 1995 but increasing again to 620.4 $gCO_2/kWh$ in 1999. This increase is due to the use of obsolete capacities, despite further increasing of natural gas share in fuel mix. The share of hydropower is about 12 % during considered period.*

**Table 5: $CO_2$ emission rate in baselines A1 and A2**

| *Year* | *Unit* | *A1 - $CO_2$* | *A2 - $CO_2$* |
|---|---|---|---|
| *1990* | *g/kWh* | *624.3* | *559.2* |
| *1995* | *g/kWh* | *580.8* | *514.0* |
| *1999* | *g/kWh* | *620.4* | *536.6* |

*Conducted analyses shows that the fuel mix is the main dominant factor for benchmark definitions for the Uzbek electricity grid. Logically, only baseline A1 reflects real $CO_2$ release from fuel combustion. Taking into consideration electricity generated by hydropower, we artificially decrease emission rate.*

### 3.4 Assessment of Additionality

Additionality is the cornerstone of CDM project selection and has been defined in Article 12.5 of the Kyoto Protocol "Emission reduction resulting from each project activity shall be certified….on the basis of: (c) that are additional to any that would occur in the absence of certified project activity". There exists a lot of opportunities for emission reductions which are profitable for a country. These should not meet additionality requirements.

Project proponents should distinguish two types of additionality – environmental related to emission reduction and investment.[2] The assessment of economical additionality proposed in some papers coincides with investment additionality and is not considered here.

**Environmental additionality** *defines as the difference between baseline and CDM project emissions.* If baseline GHG emissions are less than CDM project GHG emissions – that is $GHG_{cdm} > GHG_{bl}$, the *CDM project is not environmentally additional*.

The investor should provide the project with state-of-the-art technologies/equipment which are the best commercially available or sensible with respect to the state of domestic technologies in the host country. In this case technology additionality could ensure the emission reduction benefit additionality. Environmental additionality can be also aimed at switching fuel (for example, natural gas for coal or mazut), use of renewable energy (solar, wind, hydro, thermal). Such environmental benefits should not be achievable under the usual domestic policies in the host country.

2 We not assess financial additionality here, i.e. the fact that a CDM project does not use official development assistance.

**<u>Investment additionality</u>** *looks at the financial present value (FPV) of all capital and operational and maintenance costs for the CDM project and the baseline project, provided revenues are identical*. It is determined whether the financial present value of the costs for the CDM project is greater than the present value of the costs for the baseline project ($FPV_{pr}>FPV_{bl}$). If not, the CDM project investment is not additional to the baseline and thus the project should not be considered for CDM. However, the project may be considered by the CDM to help remove barriers or change national policy.

The determination of investment additionality of the CDM project – determining whether it has positive incremental cost is the most difficult issue in the context of baseline determination. Additionality can be seen on two levels – a macro and micro level which can differ due to externalities. A project that is clearly additional from a micro-economic point of view due to positive costs may not be macro-economically additional. Under fossil fuel subsidies, for example, a wind power plant might be clearly additional due to higher costs compared with the subsidised fossil fuel. If the subsidy was phased out, it could become non-additional.

Macro-economic additionality should be assessed to avoid faulty practice to prolong inefficient policies. The best approach would be to phase in strong macro additionality rules over a certain period of time, e.g. 5 years, to allow countries to change policies. Projects in countries that do not change policies then should be subject to a discounting of emission reductions.

### 3.4.1 Environmental additionality assessment

In order to determine GHG emission reduction it is necessary to find the difference between baseline emission and project emission during the crediting lifetime of the CDM project.

**Project emission = $k_{pr.}\ A_{pr.}$ (1)**

**Baseline emission = $k_{bl}\ A_{bl}$ (2)**

**Emission reduction = baseline emission – project emission (3)**

where: k – emission rate (factor); A – output level (activity)

***Example:*** *Average annual electricity generation by small hydropower stations (proposed as CDM project) was used for calculation of avoided $CO_2$ emission. The calculation was carried out in equation (2).*

*The volumes of annual avoided $CO_2$ emission in depending on the selected benchmark are given in Tab.6. As it follows from table, the amounts of $CO_2$ emissions vary by 15 %. Minimum $CO_2$ avoided emissions occurs using sectoral benchmark A.1*

**Table 6: Average annual amounts of avoided $CO_2$ emission (thous. t per year)**

| ***Baseline*** | ***Emission rate, $gCO_2/kWh$*** | ***SHPS-1*** | ***SHPS-2*** | ***SHPS-3*** |
|---|---|---|---|---|
| *Baseline A1* | *620.4* | *17.49* | *20.47* | *5.15* |
| *Baseline A2* | *536.6* | *15.13* | *17.71* | *4.45* |
| *Baseline B* | *579.9* | *16.35* | *19.14* | *4.81* |
| *Baseline C* | *551* | *15.54* | *18.18* | *4.57* |
| *Baseline D* | *566.9* | *15.98* | *18.71* | *4.71* |
| *Baseline E* | *792* | | | |

### 3.4.2 Investment additionality assessment

Initially the financial analysis is carried out assuming the availability of favourable local conditions for financing without taking into consideration the profit from the sale of the CERs. If the project has negative net cost but one main barrier is revealed then the project can be considered additional.

If the project appears to be financially viable it is necessary to conduct an analysis of other potential barriers (see Annex 4), to reveal the necessary additional financial means for their breaking down and to include this cost into the project analysis. This analysis is made till the barrier is revealed after which the project becomes financially unviable. Its further realisation becomes possible only with participation of the external investors which will serve as a confirmation of the additionality principle for the given barrier.

Financial present value (FPV) should take into account all relevant financial costs and benefits including (i) capital cost (investments), (ii) operation and maintenance cost and

(iii) fuel costs. This approach can be summarised by the following equation, which defines FPV as the sum of discounted costs and benefits:

$$FPV_x = \sum_{i=1}^{n} \left[capital\cos t(i) + O\,\&\,M(i)\right] \times \frac{1}{(1+r)^i} \quad (1)$$

where: $FPV_x$ is the Financial Present Value of the CDM project or the baseline;

*capital cost (i)* is the total of all capital costs (investments, interests) in year i;

*O&M (i)* are the total operation and maintenance costs in year i, including fuel costs;

*r* is the discount rate; *n* is the project lifetime in years.

Financial benefits can be excluded from the FPV calculation on the conditions that they are equal in both the CDM and baseline situation. If the two situation differ, the difference in benefits (expressed in the terms of negative costs) must be included. ***It is important to notice that the value of CERs should not be included in FPV calculation***

**Example:** *Financial analyses for proposed small hydro power stations (SHPS) were made using the following assumptions:*

- *Technical lifetime - 50 years.*
- *Investments - 6560, 7700, 1095 thousands USD correspondingly*
- *Discount rate - 8%, 10%, 12%.*
- *Weighted-average electricity tariff - 3 cents per kWh*
- *Operational expenses include annual costs – 5000 USD and the expenses for major repairs (one per 10 years) at the rate of 20 % of equipment value.*

A sensitivity analysis is based on annual changes of electricity tariff at 5%. The FPV under a discount rate of 10 % and 12 % for 10 and 15 years is given below (Tab. 7).

**Table 7:Financial Present Value for proposed CDM project**

| ***HPS*** | ***FPV(10%) for 10years*** *mio USD* | ***FPV(12%) for 10years*** *mio USD* | ***FPV(10%) for 15years*** *mio USD* | ***FPV(12%) for 15years*** *mio USD* |
|---|---|---|---|---|
| *SHPS-1* | *6.288* | *6.232* | *6.656* | *6.460* |
| *SHPS-2* | *7.376* | *7.311* | *7.653* | *7.538* |
| *SHPS-3* | *1.072* | *1.061* | *1.350* | *1.281* |

### 3.4.3 Calculation of Incremental Costs (IC)

The **incremental cost** should be based on the costs over its full (theoretical) crediting time and should be defined as the difference between the Financial Present Value (FPV) of the CDM project minus the FPV of the baseline.

*In order to calculate the costs of* $CO_2$ emission reduction it is necessary to know the cost for the baseline and the costs for the project itself plus the additional cost for overcoming the barriers. The difference between these two amounts will be the expenditures for the project implementation.

The incremental cost was estimated according to the formula:

$$IC = (NPV_{pr} - NPV_{bl)} / (\Delta CO_2 * t),$$

*Where* *IC- incremental cost of avoided ton* $CO_2$ *(USD/t* $CO_{2)}$
*NPV(FPV)*$_{pr}$ *- project NPV(FPV), USD*
$NPV_{bl}$ *– baseline NPV (FPV), USD*
$\Delta CO_2$ *–* $CO_2$ *emission reduction per year (t/year)*
*t –crediting time (year)*

***Example***: *Calculation of Incremental Costs for proposed CDM projects is given below (Tab.8)*

**Table 8: Baseline C - Incremental costs (IC) on a base FPV**

| *HPS* | $\Delta CO_2$ th.t | $FPV_{pr}$ (10%) mio USD | $FPV_{bl}$ (10%) mio USD | IC (10%) USD/t $CO_2$ | $FPV_{pr}$ (12%) mio USD | $FPV_{bl}$ (12%) mio USD | IC (12%) USD/t $CO_2$ |
|---|---|---|---|---|---|---|---|
| **10 years** | | | | | | | |
| SHPS-1 | 155.4 | 6.288 | 3.329 | 19.04 | 6.232 | 3.151 | 19.82 |
| SPHS-2 | 181.2 | 7.376 | 3.896 | 19.20 | 7.311 | 3.688 | 19.93 |
| SHPS-3 | 45.7 | 1.072 | 0.98 | 2.01 | 1.061 | 0.932 | 2.82 |
| **15 years** | | | | | | | |
| SHPS-1 | 233.1 | 6.656 | 3.846 | 12.05 | 6.460 | 3.562 | 12.43 |
| SPHS-2 | 272.7 | 7.653 | 4.501 | 11.55 | 7.538 | 4.168 | 12.35 |
| SHPS-3 | 68.6 | 1.350 | 1.132 | 3.18 | 1.281 | 1.041 | 3.49 |

*Incremental costs vary in the range from 2.01 to 19.20 USD/t* $CO_2$ *under crediting time of 10 years and from 2.82 to 19.93 USD/t* $CO_2$ *under crediting time of 15 years. SHPS-3 is more attractive in terms of incremental costs.*

**ANNEX 1**

## International financial institutes

| | |
|---|---|
| Global Environment Facility (GEF) | Major part of the GEF's portfolio is taken by "paper" projects, such as National Communications, PDF, etc. Investment projects are financed in a less extent, moreover host country's government and donor countries are supposed to co-finance the projects. Funds of GEF cover only incremental costs. Emission reductions achieved as a result of implementation of GEF projects cannot be used as CERs. |
| World Bank Prototype Carbon Fund (PCF) | PCF also offers a mixed model of funding. PCF covers only costs related to a specific reduction in emissions of greenhouse gases. Process of receiving a grant is rather complicated. Preliminary development and validation of baseline by the Bank are required. Procedures of obtaining a grant through PCF are being refined now. |
| Asian Development Bank (ADB) | The Bank funds the projects related to reduction in GHG emissions including the Clean Development Mechanism. |
| European Bank for Reconstruction and Development (EBRD) | The Bank provides soft, so-called environmental loans. It has set up an Energy Efficiency fund that could be used to get credit to finance JI and CDM projects. |
| ODA Programs | They are implemented in many developed countries. Main goal of such programs is to assist developing countries. Recent years they have funded projects related to sustainable development including climate change projects. ODA cannot be used to create CERs but to build capacity for implementation of CDM. |
| AIJ/JI/CDM Programs | They exist in a number of developed countries. They fund real projects related to reduction in GHG emissions. |
| Private investors | Several large companies, for example, Chevron, Shell, are considering and implementing pilot projects on the Clean Development Mechanism. |

**ANNEX 2**

**Approaches for setting up baseline**

| No | Approach | Description |
|---|---|---|
| | | **Top-Down approach** |
| I | ***National baseline*** | Baseline emission can be defined on a base of GHG emission and sinks inventory. Total national emission expressed in $CO_2$ – equivalent during the project lifetime should be divided and assigned as baseline emission by, inter alia, sector, region, technology, etc. in top-down manner, preferably by using energy/economic modelling. |
| | | **Multi-project approach** |
| II | ***Benchmarking*** | Benchmarks are quantitative emission rate per unit of output (e.g. tC/kWh generated). Benchmark represents average performance based on some kind of aggregation process, which usually has temporal (historic trends or projections), spatial (global, country or region) and/or sectoral dimensions |
| | ***Technology matrix*** | Technology matrix approach is used for setting the benchmarks for specific technologies. For this purpose, emission factors for a set of baseline technologies would be defined against which technologies of projects would be evaluated. The matrix would be differentiated by countries or region. The emission factors and the technology set would be periodically updated. |
| | *Default baselines matrix* | A baseline would be set for all projects of a certain category (for example, by fuel/technology /country/size) i.e. the baseline technology and corresponding emission factors would be given by default. This would also lead to a matrix of project categories and countries. The |

| | | |
|---|---|---|
| | | difference to the technology matrix is that the factors of the default matrix can be immediately used to calculate the emission reduction whereas in the technology matrix case it would have to decided which technology to use as a comparison |
| | | **Project by project approach** |
| III | Investment analyses | Within investment analyses is considered all possible technologies and project designs in terms of them micro-economic profitability. The approach assumes and models possible behaviour of governmental body using: (a) for commercial project – investment analyses of a rate of return; for public project – a cost-benefit analysis. The costs to remove barriers that impede project implementation can be included in the calculation. In each case the most profitable technology or project design is used as baseline |
| | Control group methods | Control group approach use information from outside the project to build a baseline. The approach assumes that all other factors affecting the proposed project and the control group are ideally identical so that the control group can effectively serve as baseline for proposed project. |
| | Scenario analyses | The approach to make the case for a project baseline by plausible describing and explaining the factors impacting on project decisions and thereby excluding all baseline possibilities but one. The method is less rigorous than the two above but it can be a valid cost-effective approach in relatively clear cases e.g. in retrofit projects. |

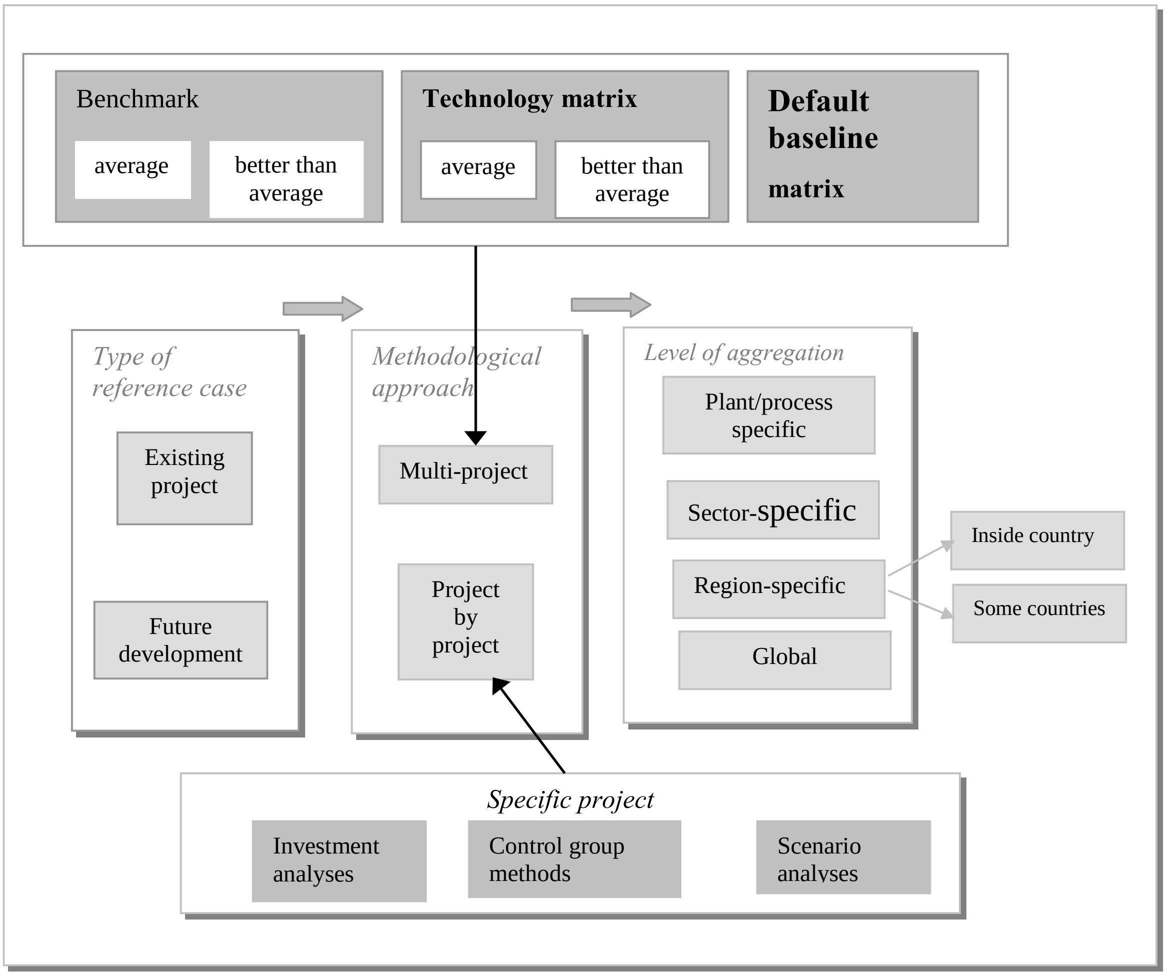
## ANNEX 3

### Matrix of choices for baseline emission rate

The definition of the baseline emission rate depends on many choices and assumptions due to the uncertainty in future development of the events in absence of the CDM project.

The matrix technique described in literature is a transparent way for explanation of the key choices and assumptions used under setting baseline.

**Fig. 5: Matrix of choices and assumption for baseline selection**




**Source:** Wood Waste Power Plants in Zimbabwe as options for CDM, Part 1 – Options for baseline and methodological issues related to CDM, 2000.

**Type of reference case -** The project could be compared with the current situation or future development without a CDM project.

**Methodological approach** – A methodological approach should be selected. Brief description of the approaches for setting baseline given in Annex 2.

Not going into unnecessary details, existing approaches for baseline setting can be united in three groups depending on level of aggregation .

The multi-project approach fixes a standardised emission rate against which a project is compared. The main difference is whether they reflect average case (average value for sector, technology, country, region) or whether they based on a better-than-average case (the best value, average value of the last investments; or the last foreign investment).

**Level of aggregation** – Project proponents have to choose the level of aggregation that is more appropriate for the baseline emission rate - single reference project or a portfolio of the projects/plants/installations. A level of aggregation could cover a plant, a sector, a region within a country, a region with some counties, or all countries. A region can be defined by geographic as well as by economic features.

A crucial element to take into account in the development of multi-project baseline is the quality and availability of data. Ideally, the following plant-specific data:

- commissioning date (in order to determine whether the plant/unit should be used in the sample of recent capacity additions);
- Type of technology (e.g. internal combustion engine; combined cycle gas turbine, etc.)
- Source of electricity generation (e.g. natural gas, water, bituminous coal, etc.)
- Generating capacity (measured in MW – it is necessary input to calculate the electricity production in MWh);
- Load factor (for what portion of total possible hours in a year is the plant/unit in operation – this is necessary to determine the electricity production in MW);
- Conversion efficiency (for fossil fuels);
- Emission factors (to convert into GHG emissions).

**ANNEX 4**

## Barrier approach

The barriers relate to all factors which impede the use of a specific technology under the specific conditions of the local investment environment. The identification and assessment of barriers to project implementation provides a suitable framework in which criteria for CDM project additionality can be set. The barrier approach based on the following principles can be used for additionality estimation:

**Table 9:Possible barriers for CDM project implementation**

| Potential barriers | Examples of barriers |
|---|---|
| Technological | • Risks for provision of the technical service for equipment<br>• Risks for project realisation<br>• High operational and maintenance costs<br>• Risks of technical breakdown or under-performance |
| Organisational/Legal | • Risk of delay of the project realisation beginning<br>• Substantial obstacles for receiving of direct investment<br>• Subsidies for the natural gas or heat<br>• Lack of institutional base for project realisation |
| Financial | • Shortage of long-term capital<br>• High cost of capital<br>• Exchange rate risks<br>• Long payback period |
| Market | • Raw material supply risks<br>• Unclear price trends for the energy carriers |
| Employees qualification | • Weak mastering of the technologies<br>• Shortage of the qualified staff<br>• Shortage of information about project possibilities |
| Ecological | • High payment for environmental pollution<br>• Toxic waste production |

- The GHG emissions offsets can be a subject for CDM crediting if reduction has been achieved as a result of the activity, which is impossible without additional financial investments, technology transfer and “know-how”.
- Projects aimed at GHG emission reductions can face different barriers: technical, financial, organisational, legal, technological, etc. in the course of their implementation.
- In order to meet additionality criteria the CDM project has to have some barriers which are absent in the project baseline. At least one of the barriers should be serious.
- Most of the possible barriers could be broken down due to attraction of the investment. Taking into consideration the economical situation in Uzbekistan financial viability of the project can be considered as dominating factor in the additionality estimation.

Qualitative barrier assessment of the CDM project carries out with use the indicators for measures additionality. The values 0,1,2 and 3 denote inexistent, small, medium and high barriers, respectively. It is important to note that for a given CDM project, one small barrier cannot compensate for a high one. (”The chain is only as strong as it s weakest link“)

**ANNEX 5**

## Glossary

| | |
|---|---|
| *Additionality* | The requirements for a project emission reduction to “be additional to what otherwise would have occurred in the absence of the project activity”. |
| *Activity Implemented Jointly* | A pilot phase for GHG reduction project activity among developed countries and between developed and developing countries. AIJ is intended to allow Parties to gain experience in jointly implemented activities. There is no crediting for AIJ activity during the pilot phase. |
| Baseline | Reference state: i.e. the situation that would occur without JI/CDM project. |
| Baseline document | A document meeting the CERs requirements, describing |

| | |
|---|---|
| | forecasted emissions without the project during each year of the crediting period as compared to the project. The document includes the projected emission reductions to be produced by the project as established on the basis of this comparison. |
| Baseline study | Document which objectively and systematically establishes the situation which would have occurred without starting the specific CDM project, regarding GHG emission by means of measurement and calculations. |
| CDM | Clean Development Mechanism is project-based mechanism introduced in Article 12 of the Kyoto Protocol covering projects between industrialised and developing countries |
| *Certification* | Certification is the written assurance by the designated operational entity that, during a specific time period, a project activity achieved the enhanced reductions of anthropogenic emissions by sources of GHG as verified. |
| *Credit* | An additional emission allowance earned by a controlled entity when it invests in reducing emissions, usually in form of a specific project. |
| *Certified Emission Reduction (CER)* | A CER represents a specified amount of greenhouse gas emissions reduction achieved through a Clean Development Mechanism project. |
| Crediting lifetime | Length of time (in years) during which a baseline can be used to calculate emission reductions by a particular plant/installation. |
| *Executive Board* | The Executive Board shall supervise the CDM, subject to the authority and guidance of the COP/MOP. Executive Board will be responsible for the accreditation of the operational entities. |
| Greenfield projects | Projects that are adding new capacity in a country |
| *Issuance of Certified* | The certification report constitutes a request for issuance |

| | |
|---|---|
| *Emission Reduction* | of CERs equal to the enhanced reductions of anthropogenic emissions by sources of GHG, as verified. Upon receiving authorisation from the Executive Board to issue CERs for a CDM project activity, it should be done assign each CER a unique serial number. |
| Joint Implementation | JI is project based mechanism introduced in Article 6 of the Kyoto Protocol between industrialised countries.. |
| Host country | The country in whose territory the JI/CDM project is located |
| Incremental cost | Specific cost of GHG emission reduction (in USD/ton of GHG) |
| Leakage | An expected increase in GHG emissions or a decrease in GHG sequestration , caused by the project activity outside the project boundaries, but not accounted for in the project baseline. |
| Monitoring | Periodic systematic surveillance/measurement of a project's performance and impact. It involves collecting project data on GHG emission reductions or other impacts that occur as results of the project by direct measurement and comparing it with the pre-established baseline. |
| Monitoring plan | Plan describing all relevant activities for registration, monitoring and measurement to provide transparent and verifiable information on project performance and number of emission reductions generated. |
| Monitoring report | Report prepared by the project developer recording the outcome of the monitoring process. |
| Multi-project baseline | Emission baseline (also referred to as "benchmarks" or "activity standards" in the literature) that can be applied to a number of similar projects. |
| Project boundaries | The project's defined geographical limits, its lifetime and its intended use of resources and technology. |

| | |
|---|---|
| Project-specific | Project-specific emission baselines are those that have been drawn up by examining projects on a case by case basis |
| Registration (record) | Document that furnishes objective evidence of activities performed and/or results achieved. |
| Refurbishment projects | Projects that modernise or replace existing plants or sites with less GHG-intensive plants or sites. |
| Thermal power plants | Power plants that burn fuel directly to produce steam. |
| Update of baseline | Updating multi-project baseline, as regular intervals, in order to continue to reflect business-as-usual electricity investments. CDM or JI electricity projects would need to use the most recently updated multi-project baseline. |
| Validation | Confirmation by examination and provision of objective evidence by an independent and qualified organisation before contracting that the project design documents, the requirements. Validation includes the confirmation that the emission reduction as claimed by the project are considered realistic. |
| Validation/verification body | An independent body, recognised by Government or its representative – as being capable of validating and verifying CERs projects, based upon the CERs requirements. |
| Validator/Verifier | Person qualified to perform validations/verifications. By meeting the relevant CERs requirements and those of the validation body. |
| Verification | Confirmation by examination and provision of objective evidence by an independent and qualified organization that the project emission reductions are achieved and that other CDM requirements are met. |