PUBLISHABLE FINAL REPORT

CONTRACT N° : ENK6-CT2001-00582

ACRONYM: BASE

TITLE: Baselines for Accession States in Europe

PROJECT CO-ORDINATOR: Energy for Sustainable Development (ESD) Limited

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REPORTING PERIOD : 1st November 2001 to 30th June 2003

PROJECT START DATE : 1st November 2001

DURATION : 18 months

Date of issue of this report : July 2003

Project funded by the European Community under the EC's Fifth Framework Programme, under the Energy, Environment & Sustainable Development Subprogramme (1998-2002)

Contents

GLOSSARY

AAU	:	Assigned Amount Unit
AIJ	:	Activities Implemented Jointly
AS	:	Accession States
CCPO	:	Climate Change Projects Office
CEECs	:	Central and Eastern European Countries
CDM	:	Clean Development Mechanism
COP	:	Conference of Parties
DH	:	District Heating
ECCP	:	European Climate Change Programme
ERU	:	Emissions Reduction Unit
ERUPT	:	Dutch Government's Emissions Reduction Unit Procurement Tender
ET	:	Emissions Trading
ETS	:	Emissions Trading Scheme
EU	:	European Union
GEF	:	Global Environment Facility
GHG	:	Greenhouse Gas
IEA	:	International Energy Agency
IPCC	:	Inter-Governmental Panel on Climate Change
JI	:	Joint Implementation
MS	:	Member State
NGO	:	Non-Governmental Organisation
OECD	:	Organisation for Economic Cooperation and Development
PCF	:	Prototype Carbon Fund
SAFIRE	:	Strategic Assessment Framework for Integrating Rational Energy
SBSTA	:	Subsidiary Bodies for Scientific and Technological Advice and Implementation
TIP	:	Technology Implementation Plan
UNFCCC	:	United Nations Framework Convention on Climate Change
WP	:	Work Package

1 PUBLISHABLE FINAL REPORT

1.1 BASE FROM THEORY TO PRACTISE

BASE was conceived after experience with the JOINT project[1] and other “learning by doing” activities (particularly ERUPT and the PCF) showed that there was very little by way of harmonised approaches for definition of additionality and baselines in the field of Joint Implementation in the Accession States of Central and Eastern Europe (CEEACs). In particular, it was shown that there was very little agreement on the means by which to demonstrate additionality under the Kyoto Protocol of the UNFCCC. The methodology and, indeed the nomenclature, for baselines were often confusing and inconsistent.

Furthermore, it was clear that there was a considerable replication of work being carried out on baselines in the CEEACs as each baseline was established on a case by case basis. There was a need to consolidate this work to harmonise baselines, baseline approaches and thus to reduce the transaction costs for developing JI projects.

BASE was designed to bring key stakeholders together in each country, with a focus on the UNFCCC “focal points”, in order to reach consensus on:

- defining how baselines should be developed and the requirements on JI applicants for demonstrating additionality under Kyoto;
- developing a harmonised nomenclature on, and framework for, baselines ranging from the simplest heat only projects to the more complicated combined heat and power grid feed in projects;
- familiarising key players in each country with various baseline methodologies and then “testing” an agreed baseline approach on “real” projects in each country;
- developing national electricity sector baselines working with key electricity sector players in each country and key government stakeholders in each country;
- comparing approaches and results between countries in a “learning by doing” approach.

In each country, a BASE “country team” was established bringing the focal points, other key government agencies (electricity sector, environment, energy, regulators), key industry players (specifically from the electricity sector), to work through the various aspects of the BASE project.

BASE addresses both the needs of industry and government in investor and host countries. The primary objectives of BASE were to agree methodologies to be applied in the host countries covered by the project (Czech Republic, Estonia, Hungary, Poland and Slovenia), to integrate into national baseline definition the work that is already being carried out in each country on emissions reporting and energy sector modelling, and to produce transparent guidelines for investors and governments on how to design, develop and approve eligible JI projects.

BASE is working with the UNFCCC "focal points" in each country and other key stakeholders (e.g., electricity and heating industry, research institutions) to develop a set of baseline tools, methodologies and guidelines tailored to the Climate Change objectives of each country. The project has developed consensus among the key stakeholders (particularly those ministries most relevant to promoting and approving JI projects) on the processes necessary to satisfy minimum requirements of additionality for JI applicants.

[1] The JOINT project was also co-funded by the European Commission under the Fifth Framework Programme (2000 – 2001). JOINT covered 14 European Countries (EU and NAS) and included representatives from government agencies and power and heat companies in each country. The project was designed to tackle many of the challenges facing JI, including the international and national frameworks, the requirements for project approval and additionality, the implications of the JI project cycle, baseline issues and project finance.

Baselines have been assessed in each of the participating CEEACs at the national level, looking at energy sector plans and modelling activities in each. BASE then tested these by focusing at a JI project level. Potential JI projects were identified in each country, and their eligibility under JI was tested. The potential credits that could be generated by these projects was assessed by the BASE core team in each country.

The focus on real projects was key throughout the BASE project. Until recently, baselines were very hypothetical and academic without the practical experience of getting projects approved and through the process of validation. Over the past two to three years there has been a far greater focus on tangible projects, through BASE, JOINT, ERUPT, the PCF and other emerging programmes. This allowed the BASE project team (including the country teams) to consolidate the wealth of experience on defining JI project additionality, and to apply baseline methodologies in JI host countries.

BASE developed a project boundary definition system built up of a number of project components that are common to all energy sector projects. The system developed under the BASE project has already been adopted by the Austrian Government. Additionally, BASE is working alongside government to facilitate JI project development by developing national criteria for JI project implementation that are clear and transparent both to potential investors and to key government stakeholders.

Guidelines have been set out for the practical implementation of JI projects, setting out the methodologies to be applied in each case, providing indications of the levels of expected credits from each type of project, and setting out requirements that will be expected for JI project baseline development in each country and internationally.

BASE has consolidated existing databases in each country that are being used for a number of purposes such as the national communications being prepared by the UNFCCC focal points and the energy planning being carried out by those government agencies responsible in each country for the energy sector.

Furthermore, working alongside governments, BASE has defined baselines for the electricity sector in each country, using tools and models that are already being used by government and the relevant sectoral players to establish the emissions framework for the sector in each country, and thereby set the framework for defining additionality of proposed JI projects. In working with governments on JI and baselines there are a number of benefits that the BASE project has bought to each of the host governments within the project and these are:

- The ability to deal systematically with the key issues of additionality
- A nomenclature and methodology to review and appraise JI projects
- The ability to compare the advantages and disadvantages of JI vis-à-vis other types of support (e.g., subsidies, targets, etc.)
- More confidence on the part of host governments in working with investors who propose JI projects, and in evaluating their JI proposals
- An understanding of the project cycle and project risk, and how they can reduce costs in JI

Considerable practical skills have been gained during the BASE project. However, there are a number of issues that still hinder JI in these countries. The foremost issue is that climate change, while important in each of the CEEACs, is only one of a number of areas requiring intensive focus as they prepare for accession to the European Union.

In all cases, governments lack the personnel, hence the capacity, to deal with the numerous pressing issues of climate change, from developing national communications under the UNFCCC, to negotiating national positions at the COPs/.MOPs, to complying with the new EU directive on emissions trading, to reviewing JI project applications. Indeed, if the climate change agenda in each of the CEEACs is to be fully developed in each Accession State, the issue of capacity and capacity building must be dealt with quickly.

1.2 PROSPECTS FOR NEW ENERGY SYSTEMS IN CEE

1.2.1 Context

Most of the countries in Central and Eastern Europe (CEE)[2] are dependent on imports of fossil fuels for their energy. There are only 3 countries that stand out as not being dependent on imports; Poland that has abundant coal reserves, Romania that has abundant gas reserves and Estonia that has abundant oil shale reserves. However, the CEE region is well endowed with renewable energy resources which are currently under utilised and could contribute significantly to reducing import dependency and greenhouse gas emissions.

As these countries move towards EU accession, as energy pricing is becoming more transparent, and as policy makers recognise the significant benefits of renewable energy development such as employment, revenues, regeneration and environmental performance, renewables are beginning to get the attention they deserve.

The legacy of 40 years of centralised planning followed 13 years of political transition and economic recession has resulted in the now independent states inheriting suboptimal energy infrastructure. The region has a history of energy intensive industry and high consumption of fossil fuels for energy production. The extended period of underinvestment, limited environmental controls and the absence of exposure to market based fuel and power markets currently generates many challenges for CEE as the countries move towards accession into the European Union (EU). The CEE region represents a huge opportunity both in the exploitation of it's renewable energy potential and in terms of energy efficiency.

There is a significant prevalence of District Heating systems in the CEE region and there a need for substantial refurbishment of the systems. This provides great scope for energy efficiency, combined heat and power (CHP) and fuel switching leading to both economic and environmental performance improvements.

The CEE Energy Sectors have embraced change and have taken many large strides towards achieving the requirements of EU Accession. Structurally the sectors are changing fast, with the traditional State owned energy monopolies partially or fully unbundling and privatising. Over the past 10 years the CEE energy sectors have experienced the same trend of investment as the European sector, with Western corporate entities acquiring generation and distribution businesses and assets. This combined with evolving national energy regulatory policies and frameworks has stimulated investment into energy efficiency and environmental performance.

1.2.2 Renewable resources

The CEE countries are rich renewable resources, biomass is particularly abundant and the countries have the potential to further develop biomass energy through agriculture. In conjunction with agricultural production, biomass provides more than 50% of the region's renewable energy resource. Most of these countries have more than 40% forest cover, whilst some have as much as 80%. The potential to develop bioenergy crops is considerably higher in the CEE region than in the EU, with former agricultural land available for energy crops such as rape and short rotation coppice.

The CEE region is rich in hydro resources, with considerable untapped potential, particularly in the Slovak Republic, Romania and Bulgaria. The hydro resources are widely distributed, and therefore less desirable. 70% of the most accessible large hydro potential is currently being exploited. Small hydro has been largely neglected during the last 30-40 years, and it remains an area of major interest and potential. Harnessing the energy potential of small hydro projects is becoming more common with the decentralisation of energy supply responsibilities, with regional administrations initiating community scale energy projects.

[2] Poland, Estonia, Lithuania, Latvia, Czech Republic, Slovakia, Hungary, Romania, Bulgaria and Slovenia.

There are significant Geothermal resources in CEE, with Bulgaria having accessible resources second only to those found in Italy. Hungary, Poland and Slovenia also have Geothermal resources which can feasibly be exploited. Opportunities for district heating heat sources exist where lower temperature geothermal resources are found.

Wind resources are sufficient to be commercially exploited in the Baltics and in Black Sea coastal regions. Due to the relatively low wind resource in comparison to the countries on the Atlantic coast, wind energy has not received much attention and has not been viewed as a high priority in the CEE region. However, the successful growth levels in Western Europe during the last 15 years, particularly in areas of relatively low wind speeds, are pushing wind up the agenda at a rapid rate. In 1990, the total installed wind capacity in the EU was 439 MW. This has now grown to more than 20,000 MW by the end of 2002 (EWEA, 2002). This growth has exceeded all expectations.

There are many lessons that can be taken from this in retrospect, but the main one is that given the correct economic, political and financial framework, even the most optimistic forecasts can be surpassed for wind energy. The greatest solar resource may be found in Romania, Bulgaria and the Balkan States. The use of solar heaters for water is common, but the opportunities to increase and improve the application of solar energy are huge. The potential for Photovoltaic applications is currently underutilised.

1.2.3 Drivers for Change

There are a number of drivers for change in the CEE energy sectors. Arguably the predominant factors are commercial and political. The political drivers relating to Accession to the European Union requires the region to integrate EU policy into their domestic legislation, thus greatly influencing the energy sector in terms of market liberalisation and environmental performance. Fundamental changes to National Generation capacity are integrated into the accession process; this includes the decommissioning of the XXMW Ignalina Nuclear Power Plant in Lithuania and the 3,400 MW Kozloduy Nuclear Power Plant in Bulgaria. In addition to these changes increasing environmental performance standards will limit the use of existing fossil fuelled capacity, or require significant refurbishments.

The EU has also proposed three sets of renewable energy targets; for renewable energy, renewable electricity and biofuels to 2010.

Under the renewable electricity Directive, the Member States of the European Union are required to set national indicative targets for the consumption of electricity produced from renewable sources (European Commission). As part of the acquis communautaire towards accession, the CEE countries have negotiated indicative targets for 2010. This process is now complete. At the time of writing, the agreed indicative targets between the CEE countries are not in the public domain so cannot be listed.

1.2.4 Implementing Change

There are no shortage of opportunities, resources and drivers to reduce fossil fuel use in the region through clean energy technologies such as energy efficiency, renewables and CHP and this is reflected in the growth in this field. However, many projects are at the commercial margin, where they require financial support to enhance their viability. In the absence of financial support mechanisms it is hard to forecast significant developments in energy efficiency and environmental performance improvements. The European Commission recently indicated that the investment required for ensuring compliance with environmental law is estimated at €120 billion for the ten CEE countries'[3].

The financial support currently available for energy sector projects which deliver environmental benefits vary greatly from preferential loans to grants. These are funded from both domestic and international sources. The Kyoto Protocol's Joint Implementation Mechanism currently offers financial support for project which deliver environmental performance improvements. Within the EU other renewable energy support mechanisms have are currently emerging such as tradable Green Certificate and the Energy Feed-in tariffs. A variety of national support mechanism are currently being

[3] DG Enlargement, European Commission, 2002

established in CEE, mainly Energy Feed-in tariffs, however, the Tradable Green Certificate solution is becoming increasingly interesting as the costs to the country of achieving growth in renewable energy is perceived to be lower.

1.2.5 Joint Implementation

Joint Implementation (JI) is a "project-based" tool that holds out considerable hope for transferring modern, clean energy technologies, particularly in the renewable, cogeneration and energy efficiency fields, from more developed countries (e.g. the EU), to economies in transition (e.g. the Central and Eastern European Countries). In so doing, the investment leads to GHG reductions that can be externally verified and credited to the investment. These emissions reduction units (ERUs) can then be utilised by the investing entity to meet environmental targets or increasingly obligations (liabilities) in their host country, or to be traded to other parties to achieve the same objectives.

Joint implementation offers great opportunities for a large number of clean energy projects that need additional support to make them economically viable. Depending on the technology the credits will have a varying impact on the IRR for the project. Table 1 below illustrates the typical impact that credits may have on the IRR. It should however be noted that there are many cases where the impact will be well in excess of this, particularly where methane abatement is involved due to the potency of the ghg. It should also be noted that for smaller projects it could be a lot less as the transaction cost of JI will reduce the benefit.

Table 1 Potential Contribution from ERU's to Project Finance

Technology	**Δ IRR**
Energy efficiency district heating	1,4%
Wind	0,3 – 1%
Hydro power	0,2% - 0,8%
Bagasse	0,5% - 3,5%
Biomass with methane	Up to 5%
Biogas with methane	> 5%

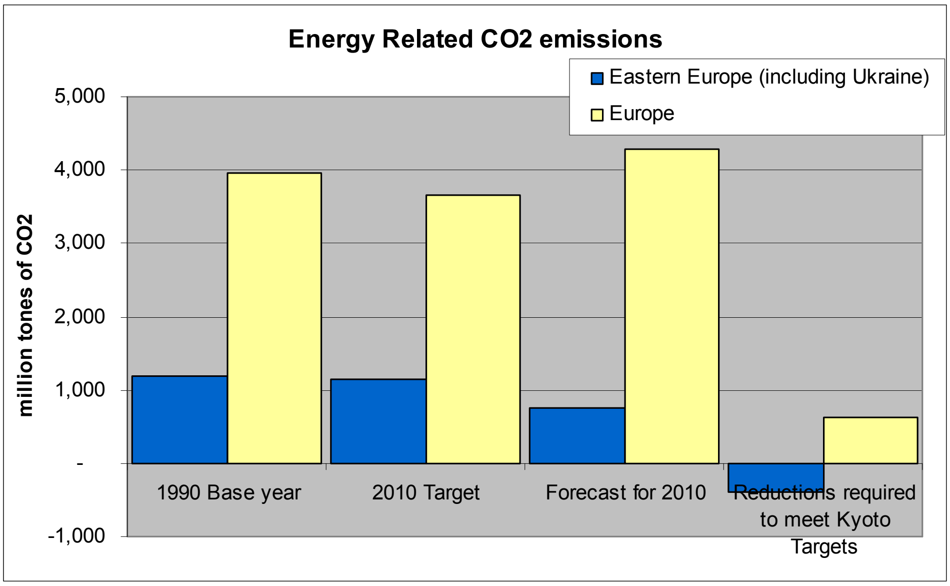
Source: Prototype Carbon Fund, 3 USD per ton of CO2

The possibility for renewables in the Accession States under JI is currently something of a concern. The framework for the EU Emissions Trading Scheme is such that renewable energy projects will not be eligible for JI after they accede to the EU and become part of the community scheme. The same is true for CHP and energy efficiency projects and this in discussed later in Chapter 7.

1.2.6 Kyoto – The Opportunity for CEE to Sell Emissions Reductions

The Newly Associated States (NAS) of Central and Eastern Europe (CEE) are not renowned for their environmental performance. The economic decline experienced by the CEE economies has reduced their consumption of fossil fuels and thus the generation of GHGs emissions. The economic decline of these countries in the context of the Kyoto Emission Reduction Targets provides the countries with a tradable asset. Figure 1 Kyoto Emission Reduction Targets for Europe and Eastern Europe illustrates the extent to which the CEE region is forecast to exceed the emission reduction targets, and the European countries are currently forecast to miss their targets. The European countries within the region have already exceeded their GHG emission reduction targets for the first commitment period. Therefore the Countries which make up CEE are able to sell the excess emission reductions to countries which may find it difficult to meet their targets due to the fact that theyhave higher GHG emission abatement costs.

Each CEE government has the option to retain the emission reduction from the base year (generally 1990), or to sell part of their emission reductions in excess of their targets to other countries which have a higher cost of reducing emissions. All 10 of the CEE Countries have signed and ratified the Kyoto Protocol.



Source: World Energy Outlook, EIA, 2000

Figure 1 Kyoto Emission Reduction Targets for Europe and Eastern Europe

1.2.7 Tradable green certificates (TGC)

Green certificate trading is gaining support and recognition as a practical solution for economically stimulating renewable energy investment in Europe. The principles of Green certificate trading are well aligned with EU energy policy, delivering financial support for renewables through a mechanism which is set by an open and competitive market.

Demand for the green certificates is driven by government set obligations for the use of electricity from renewable sources. Suppliers have an obligation to supply and increasing proportion of their electricity from renewable sources. From the renewable project perspective this means that every unit of electricity generated by your renewable energy system has two marketable products. The first is the traditional electricity which can be sold into the wholesale market at the market price, and the second is the green certificate which demonstrates that electricity was generated using renewable/green technology. Those parties with an obligation to prove they have supplied a proportion of their power from renewable sources, can purchase the green certificates to meet this obligation. This allows the renewable energy producers to gain financial support at a market price which is defined by the renewable energy obligation (demand) on one side and the availability of renewably generated power on the other (supply).

Investigations into the potential for a TGC system to deliver growth in renewable energy in CEE Countries are currently underway and will be concluded in 2004. In the mean time a mixture of Energy feed-in tariff systems and tradable green certificates will offer support for renewable energy investment through out Europe and the CEE.

1.3 JOINT IMPLEMENTATION

1.3.1 Project Cycle

The broad process of establishing validated emission reductions is common to all potential JI projects, although there will be variations between projects, purchasers and countries. The identification and marketing of emission reductions should be an integral part of the normal project development cycle and Figure 1 illustrates the relationship between the conventional project cycle and the JI process.

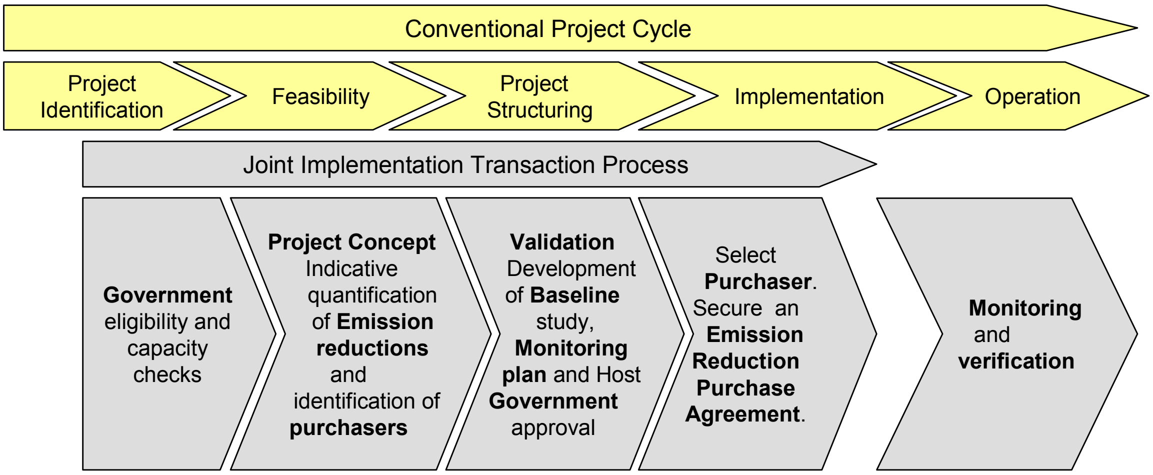


Figure 2: Energy Project and Joint Implementation Transaction Process

The host Governments endorsement of the emission reduction is crucial to the projects success and an indication of the government's willingness and eligibility to transfer ERU's should be assessed at the very beginning of scoping out a project for JI.

Assuming that the initial scoping of the project shows that there is a good potential for JI and that the host government is behind the project, the project concept would be elaborated in the form of a project identification note (PIN). A PIN generally contains a description of the project, description of the partners involved in the project, an indication of the baseline and an estimation of the ERU's that will accrue from the project. This is carried out in parallel with the feasibility assessment for the project.

The third step for JI is to develop a project design document, which is described briefly in the next section on JI design. It is at this stage in the project cycle for JI that the greatest level of effort is engaged. A full baseline study and monitoring plan must be elaborated and validated by an independent third party entity. Additionally at this stage host government approval must be sought for the project. Once the PDD has been validated and the approval has been granted the emission reduction purchase agreement (ERPA) needs to be agreed and signed by both investor and purchaser.

The final stage in the JI project cycle is after implementation of the project, when the operator of the project must monitor and report on the emissions generated by the project. The performance of the project and thus the emission reductions may then be verified again by a third party entity. This should be built in to existing environmental management systems to avoid duplication of reporting requirements on site.

The transfer of ERU's must then take place between the two governments involved in the project as they will need to make a transfer of assigned amount units.

1.3.2 JI Design

It is a requirement for each JI project to submit a project design document (PDD)[4]. The key elements of this document are as follows.

- Technical description of the project
- Baseline study
- Projections of estimated ERU's accruing from the project
- Monitoring plan
- Approval from the Parties involved (investor and host country authorities)
- Environmental impact assessment in line with the local legislation and regulation

The first task that must be carried out before moving on to these discrete elements of the PDD is to define the boundaries of the project[5]. The project boundary defines the emission sources/sinks that are affected by the project. The technical description of the project, the baseline study and the monitoring plan must be consistent with the project boundary. BASE has been developing a typology for the systematic description of projects and their boundaries in the energy sector of Central and Eastern European Accession States (CEEAS). BASE then goes on to define how the boundaries affect the choice of baseline determination methodology.

A project boundary will more than likely be comprised of a number of different components, such as power generation, heat generation, new heat consumers, landfill gas reduction etc and for each of these different components a baseline will need to be established. The components are broadly illustrated in Figure 3. The boundary of a JI project may then be built up using one or more of these basic components.

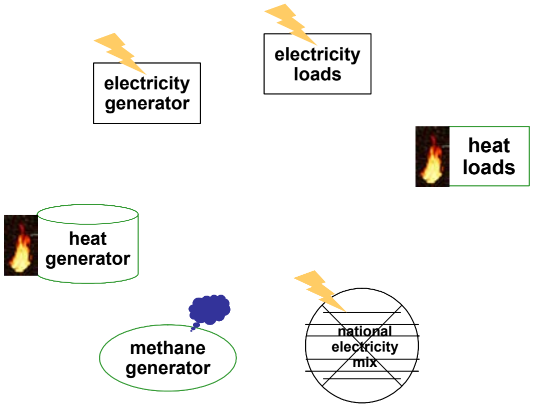


Figure 3: Project Components

This means that a project is likely to displace a number of different sources of greenhouse gas emissions and the baseline for the project will, therefore, be a composite of one or more individual baselines.

The best illustration of how to define a boundary is the case of CHP, which is illustrated in Figure 4. In this case the electricity and heat generation have been included in the boundary as well as the heat loads and the national electricity grid. It may be the case that the electricity grid is not included in the boundary, but rather the CHP plant is providing electricity for on site purposes only.

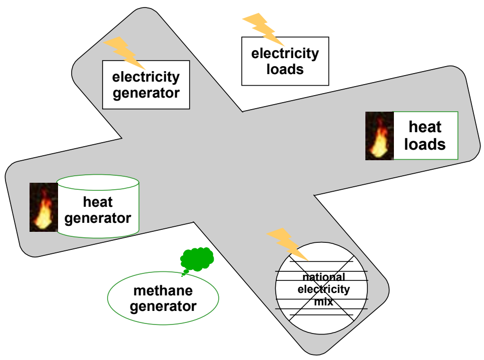


Figure 4: Example – Project Boundary for CHP

[4] "Project participants shall submit to an accredited independent entity a project design document that contains all information needed for the determination of whether the project: has been approved by the Parties involved; would result in the reduction of anthropogenic emissions by sources or an enhancement of anthropogenic removals by sinks that is additional to any that would otherwise occur; and has an appropriate baseline and monitoring plan.." Marrakech Accords, November 2001.

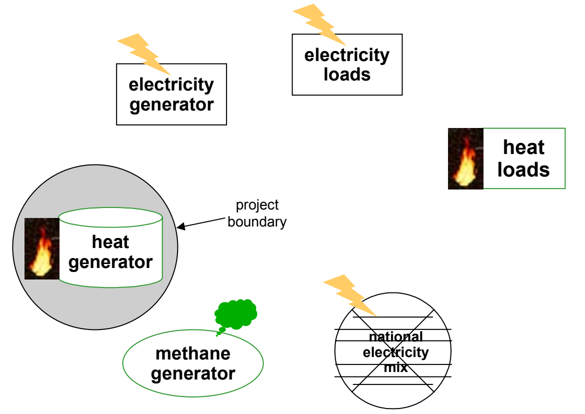
[5] The Marrakech Accords state "under the control of the project participants" as one important criterion for project boundaries in baseline studies.

1.3.2.1 Project Component Classification

A typology has been set out to further define the components set out above that seeks to address the impacts of increasing or decreasing the power and heat generation on the heat and electricity loads. This typology and the different project type components are described below. Again these project type components may be used as building blocks for definition of the project boundary and for any project, more than one component may apply.

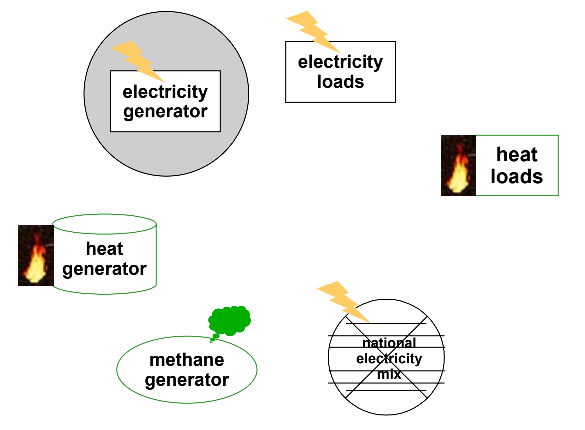
Project type component H0:
Heat only project with unchanged heat loads (change in fuel type, fuel consumption or efficiency)

If the heat loads connected to the central generating unit remain unaffected by the project in terms of total load, consumption pattern etc., the boundary may be considered to be the generator.
Example: A fuel switch project, replacing a DH coal boiler by a new DH gas boiler while the connected loads and the heat generation remain unchanged.
⇒ The project boundary includes only the boiler unit (the coal boiler in the status quo case/the gas boiler in the project scenario case). It is only the change in boiler emissions that matters.



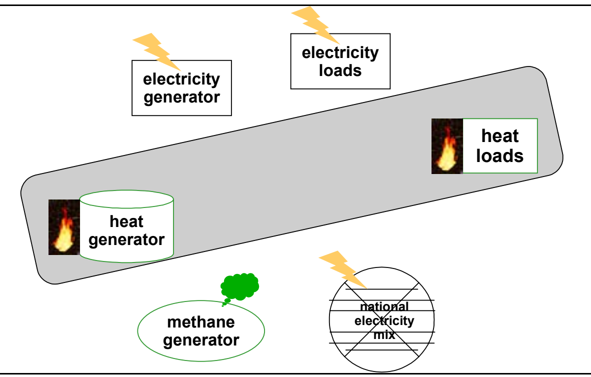
Project type component E0:
Electricity only, no or negligible change in consumption from or supply to the grid (change in fuel type, fuel consumption or efficiency of the electricity suppliers on site)

Example:
A CHP which is used to cover the base load demand of a paper mill is reconstructed in order to be fuelled with biomass. There is no change in electricity consumption from the grid or supply to the grid as a result of this project, all electricity is consumed on site.
⇒The project boundary includes only the electricity generator and the emissions from the generator. If electricity were to be sold to the grid in the future then the project would be reclassified as E± and a subsequent re-assessment of the baseline would need to be carried out to include the electricity grid.



Project type components H±:
Heat only, increase or decrease in connected heat loads, possible change in fuel type, fuel consumption or efficiency of the suppliers

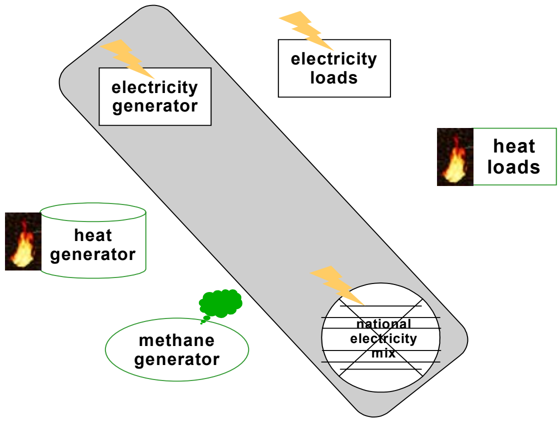
Example:
A project leads to an extension of a municipal DH-network which is supplied by a gas boiler. New customers are connected as a result of the project. The heat loads that would have continued to be supplied by oil boilers (current situation) are now supplied with DH.
⇒ The project boundary has to include the gas boiler (increased gas consumption) and the additional heat loads (as they switch to DH and no longer have individual heating systems).



Project type components E±:
Electricity only, increase in electricity supply to or decrease in electricity consumption from the grid, possible change in fuel type, fuel consumption or efficiency of the electricity suppliers on site.

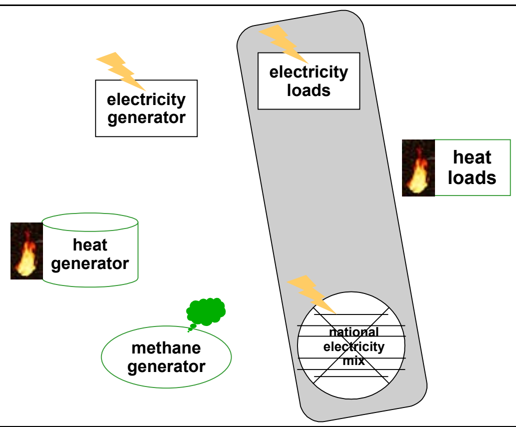
These type components are analogous to the H± components (substituting electricity for heat).
Example:
An existing power plant is refurbished. After project implementation the electric capacity is increased and more electricity is fed into the grid.
⇒ In this case the project boundary has to include:

a) The power plant on site itself (because the plant's operating parameters change: efficiency but also the electricity output increases). and
b) The power generating units which make up the national electricity mix.



Project type components E±: (Demand Side Management)

Demand Side Management is a special case for electricity because off-site emissions are reduced by changing loads (the demand side) instead of increasing the production on site. The effect from these projects on the grid is similar to feeding additional electricity into the grid and therefore the grid must be considered.



Project type M-:
Methane abatement

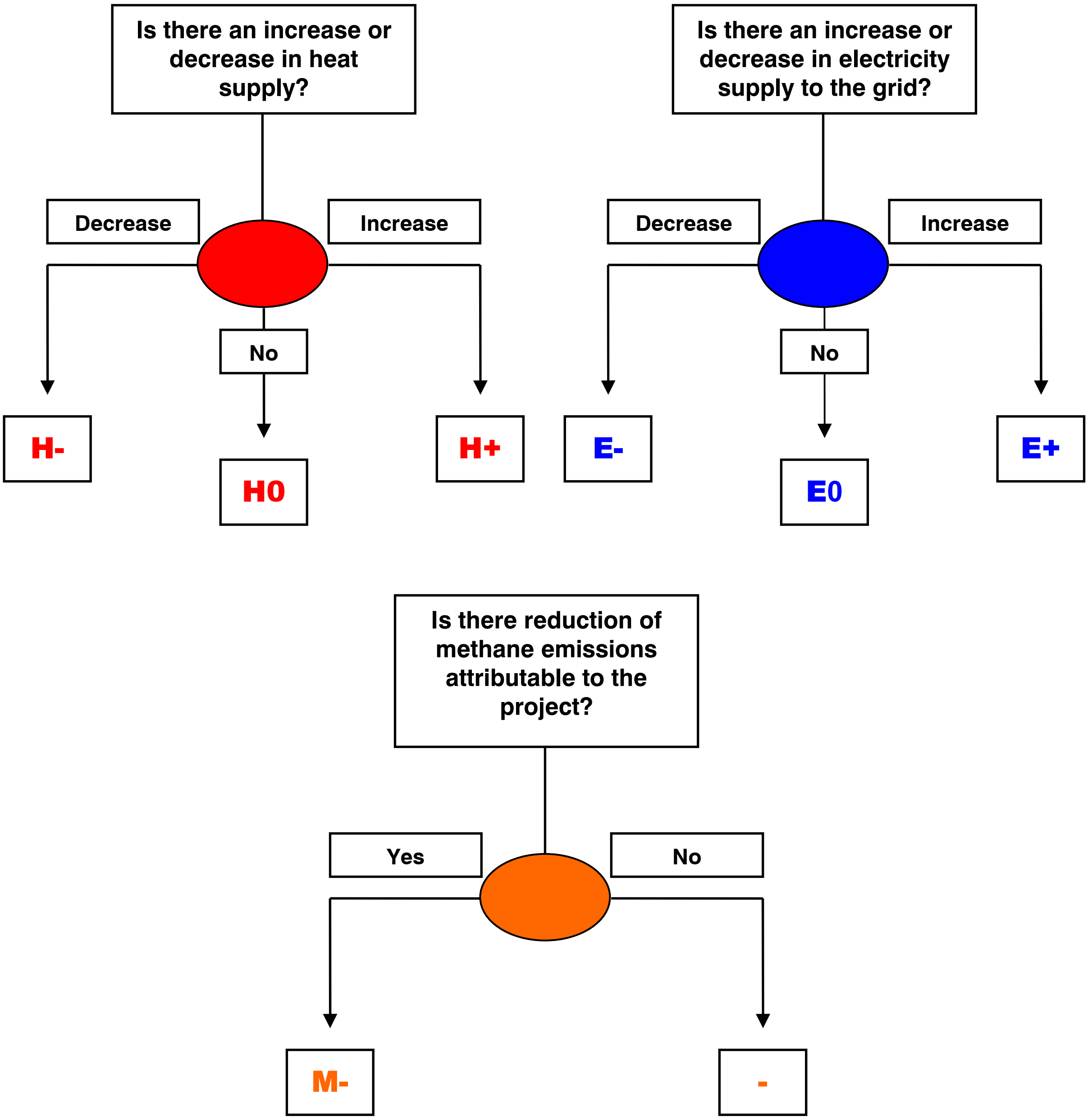
Methane abatement may be achieved by a variety of measures. The resulting project boundary depends on the way energy is recovered (if at all) from the methane and if heat or power is generated. For instance, landfill gas, may be simply flared (smallest project boundary) or combusted in a CHP-unit, a boiler, etc.

For Each project component a baseline must be established and if the component is made up of more than one element such as heat generator and heat loads (H+) a baseline will have to be drawn up for each individually

The application of these project types is dependent on the eligibility Provisions set out in the EU ETS Directive as discussed below

1.3.2.2 Identification of project type components

Figure 5 provides a route to classify the components within a project and as will be seen later, each component that has been classified here will have specific issues when selecting which baseline methodology to apply.



Component	Definition
H0	*Direct replacement of heat supply to existing customers*
H±	*A heat supply project that involves an decrease/increase in supply (e.g. network connections/customers)*
E0	*Direct replacement of an existing electricity demand with new generation (would normally be off-grid)*
E±	*An electricity project that affects supply of electricity to the grid*
M-	*A project that directly reduces methane emissions*

Figure 5: Decision Tree to Identify Project Component Classifications

1.3.3 Baseline Development

1.3.3.1 Baseline Methodologies

The BASE project addresses baseline development in two parallel phases; the first looks specifically at project case studies and the baselines that will need to be developed in each case in accordance with the typology set out above and the second is the development of national baselines for the electricity sector (E±), working with government and the national electricity sector companies.

For all other project components (H0, H±, E0 and M-) for the energy sector project specific baseline approaches have been assessed. These approaches include: investment analysis, control groups and scenario analysis. These methodologies are described briefly below and recommendations on the applications of these methodologies for the different project components are made.

Investment Analysis

The investment analysis or financial analysis approach seeks to simulate the investment decisions that would be taken in the absence of an Emission Reduction Purchase Agreement and thereby selecting the baseline option with the least cost (or highest internal rate of return/IRR).

The methodology ranks all plausible alternatives or scenarios (including the business as usual) according to their (risk adjusted) internal rate of return (or their costs or net benefits) and selects the project with the highest rate of return (or least cost or highest net benefit) as the baseline project. All project alternatives must satisfy the relevant legal, political, social, economic, technical and environmental constraints and requirements.

Step 1. Identify project alternatives
Step 2. Calculate the IRR or cost per kWh for each option
Step 3. Calculate the emissions from the best investment option or the option with the lowest cost (baseline project)
Step 4. Calculate emission reductions

Control Group Methods

A control group method would seek to find a town, region, country etc., which is comparable to the area and the circumstances that prevail in the place where the project is proposed. This "proxy" area could then be used to monitor developments in the absence of the intervention. This would serve as a comparison for the project, specifically regarding the level of emissions. The approach is best applied when the number of observation units is very large, for example individual heating units.

Step 1. Identify a similar observation group that is not affected by the JI project
Step 2. Determine sample size
Step 3. Establish methods for estimating activity and performance within the control group
Step 4. Monitor emissions from this control and the project.
Step 5. Calculate emissions reduction as the difference between the two.

Scenario Analysis

The scenario analysis approach, as does the investment analysis, seeks to simulate the decisions that would be made in the absence of JI. However the scenario analysis would be used when non-economic constraints predominate. The methodology employs a multi-dimensional analysis, which assesses all of the risks/constraints/barriers to implementation of a project and therefore seeks to identify the most likely course of development. In fact the scenario based analysis is generally used in conjunction with and investment analysis to assess the validity of the investment opportunities.

The approach again first identifies all plausible project alternatives that satisfy the relevant constraints and requirements. Then, an assessment is made of the cost, risks and other influencing parameters for each option. In doing so, the method develops an argument for the most likely scenario considering costs, external risk factors and other factors such as market demand, revenues and political environment as necessary.

Step 1. Describe current situation
Step 2. Identify plausible scenario alternatives
Step 3. Assess costs, risks and other influencing factors such as political and social drivers
Step 4. Select the baseline by process of elimination
Step 5. Calculate emission reductions

Table 2 below describes the strengths and weaknesses of each of the 3 project specific approaches and based upon these recommendations have been made in
Table 3 on which methodology should be applied to the different project components.

Table 2 Strengths and Weaknesses of Project Specific Approaches

Methodology	Strengths	Weaknesses
Investment Analysis	- Transparency - Cost Effective - Emission reductions fixed - Considers site specific issues	- Hurdle rates are variable - Financial data may be confidential - Financial data may be - Not appropriate when non-economic factors predominate in the investment decision
Control Groups	- Ability to deal with a large number of individual units	- Finding a valid control - High data requirements - High monitoring requirements - Emission reductions not fixed at the beginning of project - The control may influenced simply by being selected as a control
Scenario Analysis	- Comprehensive view of the baseline options - Ability to deal with economic and non-economic factors	- Qualitative data is difficult to validate - Includes a high number of variables and therefore large data requirements

In general the investment analysis is preferred for its simplicity and transparency and should be applied where possible (specifically in the cases of H0, E0 and M- where there can be substantial variations between sites). An investment analysis is not recommended in cases where there are a large number of consumers (H±) that would need to be assessed and therefore a large number of individual investment decisions would need to be made. In this case a scenario analysis or control group should be used. If the number of additional consumers is small an investment analysis may still be applied. This is the only case where a control group would be recommended. An investment analysis may also not be appropriate when there are drivers for the implementation of a project that exceed it's financial performance, such as social considerations or other political drivers.

The only other situation where an investment analysis would not be recommended is for the E± component where there are a large number of individual generators in an electricity grid, in this case a national electricity sector baseline should be established and the next section goes on to deal with this.

Table 3 Methodology Selection for Each Project Component

Project Component	Project specific			National baseline
	Investment Analysis	Scenario Analysis	Control Group	
H0	✓✓	✓	✗	✗
H±	✓	✓	✓	✗
E0	✓✓	✓	✗	✓
E±	✗	✓	✗	✓✓
M-	✓✓	✓	✗	✗

✓✓ Highly Recommended
✓ Recommended
✗ Not recommended

1.3.3.2 National Electricity Sector Baselines

In cooperation with the relevant Ministries in each country, the BASE project is applying models and tools that are already being used for energy sector plans and statistics as well as climate change strategies and reporting to national electricity sector for baseline definition. Each country has selected a model, in accordance with the preferences of government, to determine the national baseline.

Different methodologies for the application of the models have been assessed and in summary the preferred methodology is using a least cost dispatch methodology to identify the marginal plant that would be displaced. The data on costs and generating plant has been used in each and information on marginal plant may be available from the BASE team, however this section sets out the average emissions rate in the electricity sector in each country for simplicity and commercial confidentiality.

Czech Republic

Baseline Emissions Factors (tonnesCO2/MWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GEMIS Results	0.913			0.796				0.745				0.741
Extrapolated Results		0.874	0.835		0.783	0.771	0.758		0.744	0.743	0.742	

The baseline projection has been made using the GEMIS model, which is updated yearly with the support of the Czech Energy Agency.

Validity and Update of Baseline

The baseline could be valid to 2012 as there will not be any significant changes in investment or closures. The figures presented here may be used by an investor over the lifetime of a project, however after the figures have been updated, the revised figures should be used. The baseline should be updated in 2005 when a new Act about the implementation of RES the utilisation of RES comes into force. The total power production can be checked once a year and any significant changes might trigger an update of the baseline.

Estonia

Baseline Emissions Factors (tonnesCO2/MWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Emissions Factor	-	1.18	1.16	1.14	1.09	1.08	1.06	1.04	1.04	1.03	1.02	1.01

The baseline projection has been made using spreadsheets and the investment programme of the national utility.

Validity of Baseline

The baseline should be valid to 2012, but there will need to be revisions made due to specific events that will substantially affect the baseline (reconstruction and closures of the largest 200MW power blocks in oil shale fuelled plants) and these are likely to take place in 2005 and after 2008. This is also dependent on international treaty's, specifically the SO2 treaty between Finland and Estonia and EU directives, such as the Large Combustion Plant Directive. The baseline should therefore be revised in 2005 and 2008 when these events occur.

Hungary

Baseline Emissions Factors (tonnesCO2/MWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Emissions Factor	-	0.557	0.558	0.558	0.559	0.559	0.560	0.557	0.558	0.557	0.548	0.547

The baseline projection has been made using the ENPEP model, which is used by the national utility and the Ministry of Environment for greenhouse gas projections under the climate change strategy.

Validity of Baseline

The baseline should be considered as valid as it represents the retrofit/replacement/extension scenario that is the officially accepted scenario of Hungary; therefore there is only a very low chance that the emission baseline would become outdated. The baseline and accompanying databases will be updated annually within the framework of the UNFCCC.

Poland

Baseline Emissions Factors (tonnesCO2/MWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Emissions Factor	-	-	-	-	0.853					0.669		
Extrapolated Results	-	-	-	-		0.810	0.770	0.740	0.700		0.640	0.620

The baseline projection is based on data from Third National Communication, Assumptions of Energy Policy up to 2020 and the SAFIRE model.

Validity of Baseline

The baseline could be valid to 2012, because there will not be any significant changes in investment or closures. The figures presented here may be used by an investor over the lifetime of a project, however after the figures have been updated, the revised figures should be used. At the end of 2003 The National Climate Policy should be accepted as well as Renewable Energy Act. The *Assumptions for Energy Policy up to 2020* are monitored and updated every two years (last update was in 2002), so the baseline scenario should be updated correspondingly.

Slovenia

Baseline Emissions Factors (tonnesCO2/MWh)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Emissions Factor	-	0.405	0.407	0.412	0.408	0.397	0.395	0.392	0.384	0.380	0.376	0.376

These factors are not yet official; they are a first draft and will be subject to revision.

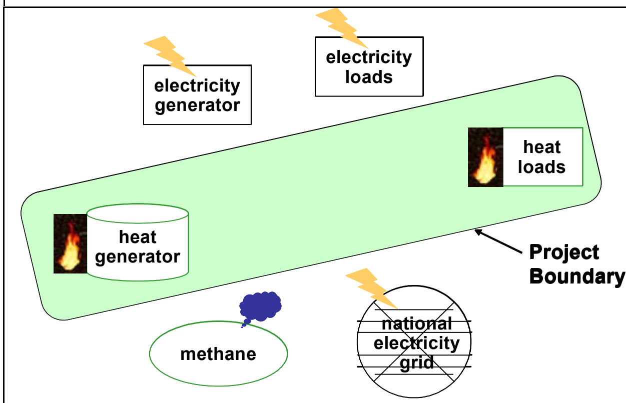
Validity of Baseline

The baseline will be valid until 2012. The baseline should be revised if the planed time schedule for some closures or new capacities will be substantially changed or delayed. The Slovenian Government should update the baseline for their own purposes every four years.

1.4 PORTFOLIO OF PROJECTS

CZECH REPUBLIC	COMMUNITY ENERGY EFFICIENCY

Project Summary
As part of a regional energy programme in the South Bohemia region in the Czech Republic it is hoped that **1000 biomass boilers**, **1000 solar panels** and **1000 double glazed windows** will be installed. The biomass boilers would replace individual coal fires, the solar panels would result in a 30% reduction in energy demand for hot water and the windows would provide a 30% reduction in space heating requirements.



Project Classification
H±
The boundary therefore includes the heat generation and the heat loads.

Baseline Methodology
In line with the recommendations on methodologies developed, in order to calculate the emission reductions of the project a **control group methodology** is being used. This is due to the fact that there are a large number of individual units to be assessed.

Baseline Selection
In order to select the control group the following criteria have been used.
1. Size – number of habitant/buildings
2. Types of buildings – single family houses, panel apartments buildings
3. Level of insulation
4. Level of heat consumption
5. Type of fuel used in the locality and the level of gasification in the area

According to the criteria above the municipality of Jilovice has been selected and to determine the baseline emissions for the project and will be monitored throughout the course of the project to compare the performance of the installations.

When the projects go ahead a survey will be carried out on a sample in order to calculate the average emissions of households in Jilovice. Jilovice village will serve as an example of the households that have not implemented any of the selected energy efficiency projects. In Jilovice present consumption can be calculated and the other houses where the projects will be implemented will be monitored also through use of a survey. Jilovice will also be monitored to test the assumptions in the baseline.

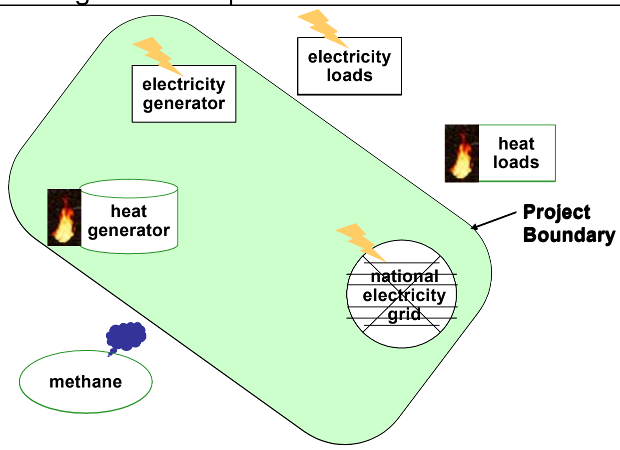
Emission Reductions
Emission reduction by the implementation of:

1000 biomass boilers	11000 tCO_2eqv/year
1000 solar collectors	9000 tCO_2eqv/year
1000 windows	5000 tCO_2eqv/year

ESTONIA	**BIOMASS CHP DISTRICT HEATING**

Project Summary
A 15We/45MWth CHP plant would be installed in an existing boiler house and district heating system. The CHP would operate as the base unit, and an existing wood fuelled 54,9MW boilers would remain as the peak load or stand-by reserve units. For the coldest winters also the existing gas fuelled boilers would be used as well as serving as the stand-by units.

The project would produce their own power with increased wood waste bio-fuel consumption and resulting emission reductions compared with the existing fuel use of peat and oil.



Project Classification
E+ and **H0**
The boundary includes heat generation and electricity generation onto the grid, there is no change to the heat loads and these are therefore not included

Baseline Methodology
A baseline analysis was carried out both for the national electricity grid (**scenario analysis**) and also for the CHP plant (**investment analysis**).

Baseline Selection
In order to calculate the effects of the project a baseline must be drawn up for the heat displacement from oil and peat as well as the displacement of electricity from the national grid. The project is classified as H0 and E+ and a baseline has been set out for each component. For the H0 component the following scenarios have been identified.

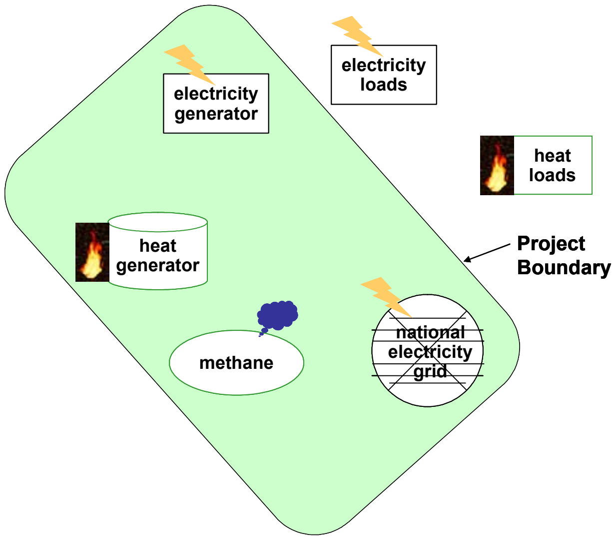
1. **Business as Usual,** the district heating system would operate as it is with some investment in refurbishments.
2. **Biomass CHP district heating without ERU's,** replacement of individual, mainly oil and wood (old technology), boilers by a biomass CHP district heating system (4 MW biomass boilers),
3. **JI scenario,** scenario 2 with ERU's included.

An investment analysis has been carried out on the three scenarios. The analysis showed that the investment has an IRR may not satisfy an investors hurdle rate for investment. A more detailed analysis of the business as usual and the costs of operating and maintaining the plant is needed to judge the project against the business as usual, this information is not currently available.

For the E+ component a national baseline has been set up based upon the future plans of the national electricity company Eesti Energia, according to this analysis the operation of the Balti Power Plant (1350 kg CO2/MWh)

Emission Reductions
July 2004-2007: 255,866 tCO_2eqv/year
2008-2012: 346,564 tCO_2eqv/year
Total: 602,430 tCO_2eqv/year

HUNGARY	**LANDFILL GAS CAPTURE**



Project Summary
The project would utilise leaking and partly flared methane from two landfill sites by installing CHP gas motors to generate heat (26.6 GWh) and electricity (37.1 GWh). This also requires an installation of a collection pipeline system and a connection to the grid and heating network.

Project Classification
M-, **H0** and **E+**
The boundary includes heat generation into an existing district heating network, electricity generation onto the grid and methane emissions from the landfill.

Baseline Methodology
According to the guidance an **investment analysis** was carried out for the methane and heat components of the project and for the electricity sector a **multi-project baseline** was developed.

Baseline Selection
For scenarios have been assessed for the methane component as follows:
1. **The business-as usual scenario, t**he exploitation of biogas potential is not implemented and the district heating system is unchanged
2. **Heat only scenario,** heat only boilers are installed in both landfill areas with installation of collector systems, pipelines, etc.
3. **CHP scenario without ERU's,** CHP is installed in both landfill areas, for heat and power production with installation of collector systems, pipelines, grid connection, etc.
4. **The JI scenario,** CHP is installed, carbon credits are generated, otherwise as above in

It is not possible currently to make a direct comparison to the business as usual scenario and in fact this scenario would have a negative cash flow and therefore from this information we can only ascertain the viability of the proposed project outside the scope of JI and it this case an IRR of between 11% and 14%, which is currently thought to be far to low to be considered by any investor, particularly due to the risks that have been identified in terms of technical risks as well as the risks associated with the sales of heat and electricity. A detailed analysis of these risks would therefore need to be carried out in order to justify the selection of the BAU scenario as the baseline. In order to complete the assessment of the baseline, it would also need to be determined at what point Hungary would need to comply with the EU Landfill Directive and therefore capture the leaking gas, this could be done by monitoring other sites in Hungary.

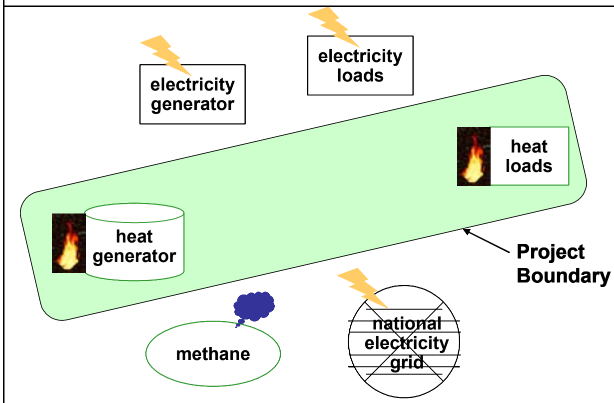
The electricity sector baseline was set up using the ENPEP model, which has also been used for the national emission scenarios for the climate change strategy.

Emission Reductions

Emissions from the CHP:	22,955 tCO_2eqv/year
Substituted emissions from the DH gas boilers:	4,966 tCO_2eqv/year
Substituted emissions from the electricity fed into the Hungarian grid:	11,583 tCO_2eqv/year
Avoided methane emissions from the landfill:	95,219 tCO_2eqv/year
Total emission reduction:	86,063 tCO_2eqv/year

SLOVENIA — BIOMASS DISTRICT HEATING

Project Summary
The project would replacing of individual mainly oil and wood boilers (averaging 5-15 years old) by a biomass district heating system.



Project Classification
H+
The boundary includes heat generation and the new district heating network. The project is classified as H+ because the district heating system would provide heat to new customers and is not displacing an existing DH system.

Baseline Methodology
A **scenario analysis** was carried out as well as an **investment analysis** for the project.

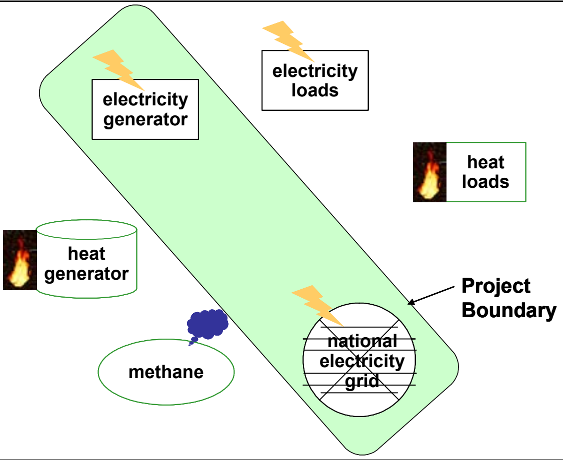
Baseline Selection
The following scenarios have been identified for the town.
1. **The business-as usual scenario,** existing heat generation in individual boilers
2. **Biomass district heating without ERU's,** the project is replacing of individual mainly oil and wood (old technology) boilers by a biomass district heating system (4 MW),
3. **JI scenario,** scenario 2 with ERU's (carbon financing) included

The business-as usual scenario has been identified as the baseline in absence of any plausible alternatives. A scenario analysis was carried out and the following options were eliminated.
- Switching to gas is improbable or rather impossible due to the lack of gas supply (the nearest gas pipeline is 20 km away).
- Switching to coal is improbable for existing oil boilers and for wood stoves (there is no such trend in Slovenia or in CEE)
- Switching to oil might be a plausible option for coal and wood fuelled units. However, neglecting the option of switching from wood to oil is a conservative assumption underestimating emission reductions.

The investment analysis for the project gives an IRR of 6.5% for the project and 7.8% with the ERU revenues. From these results it becomes clear that this project is not attractive at all seen from an economic perspective. It will not go ahead without additional incentives and even with the additional revenue from the ERU's the project still does not appear to be viable.

Emission Reductions
The emission reduction is calculated directly from the fuel consumption before and after project implementation. The fuel consumption before project implementation has been assessed by sending out questionnaires to all public buildings, to all private companies and to 166 households.

Baseline Emissions	1934 $tCO_2eqv/year$
Project Emissions	415 $tCO_2eqv/year$
Emission Reduction	1519 $tCO_2eqv/year$

POLAND	WIND FARM
Project Summary The project would install 11 clusters of 4.5 MW wind turbines (each consisting of 3 1.5 MW wind turbines) and one single 1.5 MW turbine.	
	**Project Classification** **E+** The project generates electricity only, which is fed into the national electricity grid. **Baseline Methodology** In order to calculate the effects of the project a **multi-project baseline** for the electricity grid has been established using the SAFIRE model.

Emission Reductions

Year	2008	2009	2010	2011	2012
Baseline emission factor t/GWh	884	872	861	853	845
Emission reduction tCO_2eqv/year	94,600	93,300	92,100	91,200	90,400

1.4.1 Validity of JI Projects in the context of the Community ETS

All projects may be valid in the context of the Community scheme provided that they are approved prior to the 31st December 2004. The projects in the Czech Republic and Slovenia are well below the 20MW threshold of the Community Scheme and do not interact with the electricity sector that will be covered by the Community Scheme and are therefore may generate ERU's to be traded in the scheme.

The Landfill project in Hungary is likely to be eligible for JI as methane is not currently covered by the scheme and the heat output is less than 20MW, however there may be some issues of double counting for the electricity production and the displacement of electricity is unlikely to be valid.

Both the district heating project in Estonia and the wind project in Poland are not likely to be eligible in the context of the community scheme. Although the new CHP plant in Estonia is less than 15MW the total output of the DH company is greater than 20MW and will therefore be covered as an installation within the scheme. The wind project is not eligible due to the double counting provision for carbon free sources that affect the emissions of installations covered by the scheme (i.e. the electricity sector). Both of these projects would need to seek approval for JI prior to December 2004.

1.5 RELATION WITH THE COMMUNITY ET SCHEME

1.5.1 Timescale of the Directive

A common position was adopted by the Council on the 18th March 2003 on a Directive which establishes a Community GHG emission allowance trading scheme in order to promote reductions of GHG emissions in a cost-effective and economically efficient manner. Final adoption of this Directive is expected in July this year (2003). The scheme will commence in 2005 and will be operational in two phases, both of which are mandatory. The first phase will occur between 2005 and 2007, followed by the second phase occurring in the Kyoto compliance period of 2008 to 2012 and it is anticipated that there will be further trading periods.

1.5.2 Geographical Coverage

The scheme will cover the EU 15 and the 10 Accession States joining the EU in 2004 and it is anticipated that other Countries outside the EU and its Associated States will link their domestic emissions trading schemes to the EU ETS.

1.5.3 Installations Covered

The Community scheme covers direct sources of emissions from the energy industry and the manufacturing industry. It defines the scope and size of installations to be covered by the scheme; these are detailed in Table 4 below[6]. From 2005, MS can apply ET to installations that are smaller than the capacity limits in the Directive (as long as this is specified under the national allocation plan) and in the second trading period Member States will be able to apply to bring in additional sectors to the scheme.

Table 4 Categories of Activities Referred to in the Directive

Energy activities
Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations) Mineral oil refineries Coke ovens
Production and processing of ferrous metals
Metal ore (including sulphide ore) roasting or sintering installations Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2,5 tonnes per hour
Mineral industry
Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m^3 and with a setting density per kiln exceeding 300 kg/m^3
Other activities
Industrial plants for the production of (a) pulp from timber or other fibrous materials (b) paper and board with a production capacity exceeding 20 tonnes per day

[6] Annex I of the proposed Directive

1.5.4 Gases covered

For the first trading period only carbon dioxide will be included in the scheme, but in the second period Member States will be able to apply to include other gases from the basket of six greenhouse gases contained within the Kyoto Protocol (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride). It is estimated that the scheme will cover approximately 40% of the carbon dioxide emissions from the EU.

1.5.5 Allocation of allowances

Each Member State develops its own national allocation plan by 31 March 04, stating the total quantity of allowances to be allocated for that period and how they are to be allocated.

The allocation plan must be based on objective and transparent criteria, including: how the allocation relates to the national targets under the Kyoto Protocol, consistency with the national climate change programme, no discrimination between companies or sectors, the accommodation of new entrants, recognition of 'early action', information on how clean technology is taken into account as well as ensuring that the allocation plan goes through a period of public consultation. For the three year period beginning 1 January 2005 MS's shall allocate allowances free of charge. For the five-year period beginning 1 January 2008, MS's shall allocate at least 90% of the allowances free of charge.

1.5.6 Penalties

Operators must surrender sufficient allowances by 30 April of each year to cover its emissions during the preceding year, and will be liable for the payment of an excess emissions penalty if they don't.

MS can decide the penalty they impose for the first three year period, with a minimum value fixed at **€40/tCO2e** emitted. MS must notify penalties to the Commission by 31 December 2003. Penalties must be "effective, proportionate and dissuasive". For subsequent five year periods, the penalty is fixed at a minimum value of **€100/tCO2e** emitted.

1.5.7 'Pooling'

Operators of installations carrying out one of the prescribed activities will be allowed to form a pool of installations from the same activity for the first three year period and the first five year period. A 'pool' must have a trustee who takes on the responsibility for surrendering necessary allowances etc on behalf of the pool members. However the targets will be set at the level of the installation and thus responsibility for the surrender of the allowances is on the installation covered by the Directive, whether or not the installation decides to become part of a 'pool'

1.5.8 Recognition of JI credits

ERU's generated by JI projects may be used in three ways. Firstly they may be used directly by MS governments to meet their obligations under Kyoto and the EU bubble as is the case in the Netherlands with the ERUPT and CERUPT tenders. They may be used by companies to help in meeting their cap that has been allocated under the scheme. Finally they may be used by companies that are not provided for in the EU ETS.

Each MS within the scheme may convert JI credits into allowances to be fungible with the community scheme. An installation operator may generate or purchase ERU's and apply to the national competent authority to convert the credits into allowances and these allowances would be in addition to those allocated in the national allocation plans. Allowances within the community scheme may be traded without restriction and therefore there will be no restrictions placed at the MS level in the recognition of JI credits. Provisions for the recognition of JI credits within the community scheme will be set out in the Directive, based upon the provisions set out in the Kyoto Protocol and the Marrakech Accords. The conditions that have been set out for the conversion of JI credits are set out below.

1.5.9 Conditions

1.5.9.1 Validity of ERU's

ERU's may only be exchanged for allowances during the period 2008-2012 because under Kyoto ERU's will not be available until this period.

1.5.9.2 Supplementarity

There are two mechanisms by which the issue of supplementarity will be addressed; within the community scheme and outside the community scheme. Outside the scheme there is a separate proposal for a monitoring mechanism of Community greenhouse gas emissions and the implementation of the Kyoto Protocol, which requires MS's to monitor and report on the use of JI (and CDM) as a supplemental mechanism to domestic measures.

The requirements within the Community scheme are set out to harmonise the level of effort that is required by installations across the community, whilst operationalising the Kyoto Protocol and Marrakech Accords. It is for this reason that a quantified limit has been set on the conversion of ERU's (and CER's) into EU trading allowances. The limit that is proposed is 6% of the total allowances that are issued in the national allocation plan.

1.5.9.3 Double Counting

In order to avoid the double counting of emissions from the installations covered by the scheme and to ensure consistency of approach to the issue of double counting, conditions have been set out for the conversion of JI credits in the scheme.

Table 5 Sectors that are Excluded from the Generation of ERU's and Conversion to Allowances

Carbon free sources	Carbon free sources will not be allocated allowances and cannot generate ERU's for the conversion to allowances in the Community scheme if they lead directly or indirectly to a reduction in emissions from an installation covered by the scheme (e.g. the electricity sector).
Indirect Emitters	Consumers of power, heat or steam that are not direct sources of emissions will not be allocated allowances and cannot generate ERU's for the conversion to allowances in the Community scheme.
Installations covered by the scheme	An installation covered by the scheme cannot at the same time gain credits under JI.

1.5.9.4 Technologies

The conditions that have been set out above on double counting immediately have implications for certain technologies being approved as JI projects within the countries covered by the scheme[7], which is particularly relevant to JI projects in the Accession States. The conditions immediately exclude **greenfield renewable energy** projects[8], **nuclear facilities** and **demand side energy efficiency.** In addition there are other activities and technologies that are specifically excluded from the generation of credits for conversion to allowances.

The first is again **nuclear energy**, which was specifically excluded in the Marrakech Accords. The second is land use, land use change and forestry (**LULUCF** activities) as this does not contribute to the community schemes goal for long term emission abatement from energy and industrial processes. The third technology that has restrictions on use for conversion of JI credits to allowances is **production of hydro-electric power from non-sustainable installations** in accordance with the World Commission on Dams criteria and guidelines.

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[7] The double counting conditions only apply to those countries that are part of the community scheme. For countries outside the scheme there will not be an issue of double counting and therefore these conditions will not apply. They will also not apply for projects covered by the CDM.

[8] Installations that are considered to be direct sources of emissions may convert to renewable based fuels, such as biomass, which would then be eligible for either the Community trading scheme or JI but not both (See the third condition in Table 5)

1.5.9.5 Exemptions for JI in Accession Countries

There is a provision set out that allows for temporary exemptions to be applied for in host countries for projects that fall within the scope of the Community scheme (activities set out in Table 4 above) and are approved in the Accession Country prior to their joining the Community scheme. This means that in the first ten Accession Countries joining the EU in 2004 and joining the Community scheme at the beginning of 2005, they may still approve JI activities that would not be allowed under the rules of the scheme until the 31st December 2004. These projects may continue to generate credits up to 2012 provided that they have been taken into account in the national allocation plan.

For Accessions Countries joining the EU after 2004 a similar rule will apply and therefore any JI project that is approved prior to their date of accession may still be granted exemption by the host country from the conditions set out by the community scheme.

1.5.10 Prospects for JI in Accession Countries in Respect of the Community Scheme

1.5.10.1 Installations not Covered by the Scheme

As noted above there is a condition that the installations covered by the scheme are not eligible for JI due to double counting of emissions, however that is not to say that there are not opportunities within the sectors covered, specifically there are opportunities for JI below the minimum thresholds that are set for the installations. In the case of the combustion installations, those with a rated thermal input below 20 MW will still be eligible for JI emission reduction projects.

1.5.10.2 Gases not covered by the Scheme

In the first phase of the scheme only CO_2 will be included. In the second phase (2008 – 2012) it will be up to the MS's to apply to include other greenhouse gases, there may be opportunities to use JI as an instrument for those gases that are not included by a host country.

1.5.10.3 Fuel Switching in Installations Not Covered by the Scheme

It has been set out that renewable technologies may not be included in the scheme and may not have emissions allowances allocated to them; however it is still possible for a direct emitter to undergo a fuel switch to a renewable fuel and be eligible for JI under the scheme. This does not fall under the same doubling counting provision that has been set out for renewables.

1.5.10.4 Early Approvals in the First 10 Accession Countries

Provided that approvals have been sought by the 31st of December 2004, JI projects will remain eligible until 2012 and there are therefore some short term opportunities for those installations that will be covered by the Community scheme.

1.5.10.5 JI in Countries not Covered by the Scheme in 2005

There will be further opportunities in countries that will not be acceding to the EU until a later date; in particular Bulgaria and Romania where Accession is due in 2007 and therefore JI projects may be approved until then.

1.6 ACKNOWLEDGEMENTS

The project coordinator, ESD, would like to thank the country teams for their input to the production of this report and in particular would like to thank the following individuals:

Agnieszka Bolesta, Ministry of Environment, Poland
Andrej Kranjc, Ministry of Environment, Slovenia
Angela Friedrich, Ministry of Environment, Austria
Cveto Kosec, Ministry of Environment, Slovenia
Gertraud Wollansky, Ministry for Agriculture, Forestry, Environment and Water, Austria
Harri Laurikka, Electrowatt-Ekono, Finland
Heidi Hallik, Ministry of Environment, Estonia
Ismo Ulvila, CDM/JI Pilot Programme, Finland
Jan-Willem Bode, Climate Change Projects Office, UK
Jolanta Galon-Kozakiewicz, National Fund for Environmental Protection, Poland
Jonathan Thomas, Climate Change Projects Office, UK
Kari Hamekoski, Electrowatt-Ekono, Finland
Kati Kulovesi, CDM/JI Pilot Programme, Finland
Ludmila Skurokova, CityPlan, Czech Republic
Magdalena Rogulska, EC BREC, Poland
Manfred Stockmayer, KWI, Austria
Mari Koppel, Ministry of Economic Affairs, Estonia
Marjan Seliskar, ISPO, Slovenia
Mark Molnar, SystemExpert, Hungary
Mateja Seliska, ISPO, Slovenia
Olga Danilova, EC BREC, Poland
Piotr Lazowski, Ministry of Environment, Poland
Sandor Molnar, SystemExpert, Hungary
Sylwia Krzoska, Ministry of Environment, Poland
Thomas Lewis, KWI, Austria
Tomas Chmelik, Climate Change Unit, Czech Republic
Tibor Farago, Ministry of Environment, Hungary
Ülo Mets, Estivo, Estonia

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