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Financing and Financing Mechanisms for Joint Implementation (JI) Projects in the Electricity Sector

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This report evaluates the potential role of current financing practices and mechanisms in the development of Joint Implementation (JI) projects, in the context of the electricity sector in Central and Eastern European countries. It explores how greenhouse gas emission reduction commodities can be integrated into the financing process, and used to enhance the financial viability of projects, and leverage acceptable or improved finance packages.

This report explains how the financing of projects is undertaken, and then explores how emission reduction value can be structured to enhance the financing prospects of projects. It also outlines the policy context and the emission reduction market evolution to date, and reviews existing financing sources.

This report is produced on behalf of the Foreign and Commonwealth Office, and was funded through the Climate Change Challenge Fund. The report is partly based on research undertaken as part of a European Commission funded project 'JOINT' – Joint Implementation for International Emissions Reductions through Electricity Companies in the EU and CEE Countries, in which EcoSecurities (the authors of this paper) are participating.

1.1 Results

Key findings are:

- The primary method of financing supply side generation projects is limited recourse financing. Demand side energy efficiency projects are financed through general corporate financing of energy service companies (ESCOs) and add-on facilities to generation projects.

- Carbon Purchase Agreements (CPA or emission reduction purchase agreements) with creditworthy parties will be vital to ensure that lenders and investors are able to take account of emission reduction value in their analyses.

- Our analysis of up-front transaction costs, based on the assumptions of a price of $3 tCO2 and our estimates of transaction costs, revealed that if up-front transaction costs equalled $57,000, a project would probably have to generate approximately 75,000 tCO_2 per annum to be viable . When costs are higher ($90,000) the amount of emission reductions (ERs) would need to be at least 105,000 tCO2. However, it should be noted that the above analysis does not take into account the operational costs, or other potential costs – like adaptation levy, administration charge etc. These costs would have to be considered before a final decision can be made about the viability of a JI project.

- Conventionally investors and lenders will only invest in activities in which the key project participants are able to demonstrate a track record in respect of their particular project task. This is particularly relevant in the JI market because many of the emission mitigation technologies such as renewables are either new or commercially marginal. This will probably mean that the JI market in the early years is likely to be dominated by experienced project developers, operators, and technology suppliers in order to reduce the risk associated with non-performance. This is crucial to JI projects because the credibility and reliability of the seller and buyer will largely determine the emission reduction quality, and thus price.

- For securing emission reduction value project start-up costs and operational costs, for both small and large projects, are similar in absolute terms. Large projects are more attractive than small projects to potential investors, lenders, and emission reduction purchasers. This will be a

problem for small project developers and strategies will have to found to overcome this problem. The strategies could involve:

1. Larger grant components to increase viability.

2. The bundling or securitisation of smaller generation or energy efficiency projects, which may reduce some of the transaction costs.

- Interest is being generated amongst the financial community on the financing opportunities that are emerging for clean technologies in the JI market.

1.2 Policy Consequences

There is a need for a clear and transparent international and domestic policy framework. For the JI market to be attractive to potential commercial investors and lenders there are number of aspects in the policy framework that need to be resolved. These are:

- There must be no retrospective action that will harm a project's financial performance, which for a JI project will be based, in part, of the revenue from ERs. Once ERs have been validated and certified, their qualification as an Emission Reduction Unit (ERU) must be binding and permanent. There can be no retrospective action by regulatory authorities to disqualify or disallow ERs once they have been authorised. If there is a possibility that ERs could be retrospectively disallowed it will have a negative impact on the price ERs achieve because the purchaser or seller will have to take on the additional risk that ERs may not be deliverable.

- There has to be certainty as to the title to the ERs. The eventual regulatory structure must explicitly permit private sector ownership of ERs and their transfer between non-governmental entities.

- The project eligibility criteria and in particular the baseline and quantification procedures (accounting for emission reductions) must be clearly laid out. This will have to be the case whether host governments, international regulations or a combination of both impose the rules. Those concerned with project financing (developers, lenders, investors) will want to be able to accurately predict the ER flows, and thus calculate their potential value, for cash-flow analyses.

- There needs to be certainty as to whether and how the adaptation levy and CDM Executive Board administration levy will be imposed.

- It is preferable to explicitly allow for early crediting otherwise the only early project implementation (i.e. before 2008) that can occur will be based on the forward sales of ERs which will be substantially discounted, which is also likely to limit JI to only the largest of project activities.

- Investment additionality is an unworkable concept that will merely lead to gaming, and one that would conflict with commercial confidentiality requirements.

2 GLOSSARY

AIJ	Activities Implemented Jointly	A mechanism governing project-level carbon credit activities between 1995 & 2000 or 2001.
	Allowance	An allowed, possibly tradeable, right-to-emit, in a country that has taken on an emissions cap under the Kyoto Protocol. Denominated in increments of tonnes of CO2.
CDM	Clean Development Mechanism	A regulatory framework, introduced by the Kyoto Protocol, governing project-level carbon credit transactions between developed and developing countries.
CEE	Central and Eastern Europe	
CER	Certified Emission Reduction	The type of emission reduction commodity that the project would ultimately be able to claim, under the CDM. Commonly denominated in tonnes of CO2.
	Commitment Period	The time period (2008-2012) during which industrial countries will restrict emissions to the set level agreed upon in the Kyoto Protocol.
COP	Conference of the Parties	These are annual conferences of the Parties to the FCCC to determine design and modalities for implementation.
CPA	Carbon Purchase Agreement	Also referred to as an Emission. Reduction Purchase Agreement.
ERC	Emission Reduction Credit	A generic term for the claimed carbon benefits arising from project-level activities in all situations (including CERs) also shortened to "credit" or "ER" throughout this report.
ERUs	Emission Reduction Unit	ERUs are the technical term for the output of JI projects, and equivalent to the content of the term carbon credits and carbon offsets.
ET	Emissions trading	A pollution compliance mechanism introduced to climate issues by the Kyoto Protocol allowing the trade of surplus emission allowances between developed countries.

FCCC	Framework Convention on Climate Change	An international legal instrument on climate change, signed in 1992.
GHG	Greenhouse Gas Gases,	principally carbon dioxide (CO2), that contribute to climate change. For purposes of standardisation, all GHGs are given as CO2 equivalent values.
IRR	Internal Rate of Return	
JI	Joint Implementation	A mechanism governing project-level carbon credit activities pre-1995, and also between 2008-2012 among developed countries.
KP	Kyoto Protocol	An international legal instrument on climate change containing emission reduction commitments for Annex 1 countries.
PPA	Power Purchase Agreement	Also referred to as a sales/offtake agreement.
SMEs	Small and Medium Sized Enterprises	

3 INTRODUCTION

This report evaluates the potential role of current financing practices and mechanisms in the development of Joint Implementation (JI) projects, in the context of the electricity sector in Central and Eastern European countries. It explores how greenhouse gas emission reduction commodities can be integrated into the financing process, and used to enhance the financial viability of projects, and leverage acceptable or improved finance packages.

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This report aims and objectives are to:

- Explain how the financing of projects is currently undertaken.
- Explain and explore how emission reduction value can be structured to enhance the financing prospects of projects.
- Examine potential JI project case studies to assess financing prospects compared to existing financing sources.
- Review existing financing sources.
- Highlight opportunities, barriers, and potential solutions to financing JI energy projects.

Section 4 - Policy Context, provides the reader with a background to international policy developments, which are driving the emerging GHG emission reduction market. Section 5 - Market Evolution, gives an overview of the market development in emission reduction commodities to date.

Section 6 - Financing Electricity Sector Projects, explains how projects are conventionally financed, by examining the current models and procedures adopted in financing electricity sector projects. This should enable those involved in the JI project field, who are not necessarily familiar with the finance world, to understand how projects are facilitated and structured. Section 6 also provides the context for subsequent discussions on financing JI projects in Section 7.

Section 7 – JI, Emission Reductions and Financing Projects, explores how the Emission Reduction (ER) revenues can be incorporated into the financing structure of JI electricity sector projects. More specifically this Section examines the use of ERs in financing models currently used in electricity sector projects, reviews the roles of the key parties involved in incorporating ER value within the finance package, evaluates the impact of ER value on financial viability, and examines the risks related to ERs.

Section 8 – Financing Sources – Institutions and Instruments, reviews a survey of institutions and their services in relation to financing energy sector projects (undertaken as part of the JOINT work) and co-ordinated by the Dutch firm Ecofys.

4 POLICY CONTEXT

4.1 Introduction

This section provides a background on the evolving policy context that will govern how Emission Reduction (ER) value can be generated under the Joint Implementation (JI) mechanism. It sets the context for subsequent discussions, in Section 3 on the evolution of the emission reduction market to date, and Section 5, on using ER value in the financial structure of project.

4.2 International policy

International policy developments are based on the 1992 United Nations Framework Convention on Climate Change and the 1997 Kyoto Protocol.

4.2.1 United Nations Framework on Climate Change and Activities Implemented Jointly

At the United Nations Conference on Environment and Development in 1992 in Rio de Janeiro, the effect of greenhouse gas emissions on climate change was recognised as one of the greatest environmental threats facing the world. As a first step to regulate this problem the nations of the world signed the United Nations Framework Convention on Climate Change (UNFCCC). The objective of the FCCC is to stabilise greenhouse gas concentrations in the atmosphere at 1990 levels. The FCCC came into force in early 1995 when over 175 countries ratified the framework. The FCCC states that the Parties may implement measures to reduce their GHG emissions jointly with other parties. This specific inclusion of *flexible* market-based instruments was predicated on the assumption that allowing businesses to seek out cost-effective emission reduction opportunities would be significantly more efficient than regulatory led emission reduction measures.

In 1995, at the first Conference of the Parties (CoP1) of the FCCC in Berlin, developing countries' opposition to the JI mechanism[1] led to a compromise called the Activities Implemented Jointly. AIJ is a pilot program conducted to establish protocols and to gain experience and information but without any formal crediting allowed. The AIJ phase ended in 2000.

4.2.2 The Kyoto Protocol

In December 1997, the Kyoto Protocol was adopted at the conclusion of CoP3. The Kyoto Protocol was opened for ratification on March 16, 1998 and becomes legally-binding 90 days after the 55th government ratifies it, assuming that those 55 countries account for at least 55 per cent of developed countries emissions in 1990. As of 6 September 1999, over 80 countries had signed the Kyoto Protocol and 12 had ratified it.

The most important aspects of the Kyoto Protocol are:

- The binding commitments by 39 developed countries and economies in transition (referred to as Annex B countries)[2] to reduce their GHG emissions by an average of 5.2% on 1990 levels during the first commitment period, 2008-2012.

[1] Opposition was based upon several factors; a sense of atmospheric equity, in that industrial countries are by and large responsible for GHG emissions historically, that GHG restrictions could make developing countries more attractive to site GHG intensive industries, and the general sense that emissions trading would allow industrial countries to buy their way out of environmental responsibilities

[2] The term Annex I and Annex B countries are almost used interchangeably. However, strictly speaking Annex I refer to the 36 countries listed in Annex I of the UNFCCC. The responsibility of the Annex I

- The use of three instruments for facilitating the achievement of GHG emission reduction targets, collectively known as the *flexible mechanisms*.

A brief explanation of the flexible mechanisms:

Quantified Emission Limitation and Reduction Obligations Trading: More commonly known as Emissions Trading, allows for the transfer of Assigned Amounts of GHG emissions among emissions-capped Annex B countries. Countries that emit less than their cap is allowed under the Protocol to sell surplus allowances to those countries that have surpassed their cap. Such transfers do not necessarily have to be directly linked to emission reductions from specific projects. A second form of emissions trading is the trading of ERs generated from project specific JI and CDM activities.

Joint Implementation: Climate change mitigation projects implemented between two Annex 1 countries and allows for the creation, acquisition and transfer of "Emission Reduction Units" or ERUs.[3]

The Clean Development Mechanism: Climate change mitigation projects undertaken between Annex 1 countries and non-Annex 1 countries. The CDM is the Kyoto flexibility mechanism of most relevance to developing countries. Under the CDM emission reductions must be independently certified, which gives rise to the term "Certified Emissions Reductions" or CERs, which is the specific output of CDM projects.

4.3 JI, CDM and Project Eligibility

None of the flexible mechanisms are operational yet and may not be so until the Kyoto Protocol enters into force wherein outstanding questions regarding the mechanisms form and structure are resolved. At CoP4 in November 1998, a deadline for a timetable to resolve these questions was set for CoP6, due to take place November 2000.

Although there is still some uncertainty in relation to the rules for JI, based on the various stipulations in the Kyoto Protocol (KP), and the options presented in the Subsidiary Body (SB) 12 Lyon negotiating text, two possible operational models exist in relation to JI. These are:

1. That JI will be subject to the same regulatory framework as the CDM.

2. That a twin track approach will be adopted for JI. This approach suggests that there will be two separate approaches for countries depending on monitoring and reporting requirements of the KP. For those countries that are in full compliance with monitoring and reporting requirements of the KP there will be no internationally imposed requirements. It will be left to individual countries to determine their own rules governing project eligibility. For those not likely to comply with the requirements, they will have to adhere to the same rules that apply to the CDM.

The approach that will be adopted at COP6, or at COPs thereafter, is undecided at the present time. The twin track approach might suggest that the rules governing project based emission reductions might be simpler under JI, for compliant host countries, when compared to the CDM. But it is

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countries are non-binding. The Annex B countries are the 39 emissions-capped countries in Annex B to the Kyoto Protocol.

[3] ERUs (Emission Reductiion Units) are the technical term for the output of JI projects

likely that even under this scenario, host countries will have similar concerns as those raised by the CDM such as ensuring environmental integrity and sustainable development.

Therefore for the purposes of this document we assume that the likely requirements for JI projects will be similar to those for the CDM, and consequently we examine the implications of these requirements for JI. In the following section we explore requirements under the CDM framework.

Based on the Kyoto Protocol, the history of AIJ projects and the negotiating text, it is possible to identify several requirements that are likely to be the most important for securing project based emission reductions, under a CDM like regulatory framework. The likely requirements for an eligible project under CDM type rules are:

1. **Additionality** The project has to prove that it "*would lead to reductions in emissions that are in addition to any that would occur in the absence of the project activity*".[4] As well as referring to emissions additionality this requirement has been interpreted in the SB12 Lyon text as referring to the financial, technological and investment aspects of a project.

   Emissions additionality The aim of the KP is to lead to emission reductions that are lower than if no action (business as usual) is taken to lower emissions. Accordingly, for any project to be eligible, it is necessary that the project demonstrates that the emissions from its activities are 'different' than the ongoing business as usual emissions trajectory.[5]

   A variety of methods have been used by project proponents to demonstrate additionality. Most of these hinge on demonstrating a behavioural difference between the actual project scenario and a hypothetical 'baseline scenario', which comprises projected standard or business-as-usual practices. For an energy project, the baseline is the level of emissions that would have existed in absence of the project activity. Emission reductions are considered additional when the baseline emissions are higher than the emissions of the project scenario.

   The baseline scenario can be fully described as the collective set of economic, financial, technological, regulatory and political circumstances within which a particular project is implemented and will operate. Establishing the baseline scenario thus requires knowledge of both historical and current conventional practices and policies, local socio-economics, national or even global economic and technological trends, etc., all of which must be projected into the future over the lifetime of the project. Consequently, baseline scenarios are necessarily based on a range of assumptions, which can vary in their subjectivity. As a result, there is currently much uncertainty as how to establish a baseline and quantify emission reductions. A study from OECD indicates that a huge variety of baseline approaches has been used for project under the AIJ Phase, for energy as well as forestry projects (Ellis, 1999).

   The development of guidelines and standards for establishing baselines would reduce the subjectivity and variety of different approaches.

[4] Kyoto Protocol Article 12.5 (c)

[5] This criterion of 'additionality' is particularly critical for CDM transactions as compared to JI. In a JI transaction, both the interacting parties have their respective emission caps. Hence the investments in any activity that do not lead to real reductions, i.e. reductions greater than baseline, would not be acceptable to at least one of the parties since it would not lead to overall reductions in emissions for at least one of them. In a CDM transaction, the host party (the developing country) does not have an emission cap. Hence even if the investment does not lead to real reduction in emission, there is an incentive for the parties to go ahead with the investment. The host party attracts financial flows into its country, and the investing party receives emission reduction credits. The problem is that to quantify emission reductions, one has to estimate what would have happened in the absence of the proposed activity, which is a very complex issue.

Financial additionality Funding for CDM projects must not result in a diversion of funds from overseas development assistance (ODA). This applies to Annex 1 Official Development Assistance (ODA) transfers, funding mechanisms under the Framework Convention on Climate Change, and the various multilateral development bank and development agency activities. The concern is that ODA-type investments will be redirected to CDM investments.

Investment Additionality In order to claim financial additionality, a developer must be able to prove that the project would not have been commercially viable without the revenue from the project generates emission reduction credits. This is intended to prevent project developers from claiming carbon benefits from activities that would have gone ahead anyway. But because cash-flow projections are generally easier to manipulate than emission forecasts, there remains some controversy as to how the investment additionality of projects can be verified. This aspect of additionality is rejected by most private sector practitioners as unworkable.

Technological Additionality That technologies should be the best available technology for the host.

2. **Supplementarity** Activities under the CDM must be supplemental to domestic mitigation action by Annex 1 Parties (i.e. the developed countries can fulfil only a part of their commitments through the flexibility mechanisms). The extent to which the mitigation takes place domestically or through the flexible mechanisms is still to be defined and will depend on the emerging international agreements and domestic policies adopted. The EU is urging that only 50% of a national emission reduction commitment be met by use of the flexible mechanisms. Whilst this will not affect a project's ability to generate emission reduction credits, it may have an impact on the price of credits because if supplementarity is enforced, the market for them will be restricted.

3. **Externality** The positive or negative effects (i.e. externalities) of projects must be considered in any thorough project evaluation. These externalities may include both GHG and non-GHG effects. GHG externalities, or 'leakage', are defined as any consequential effects that release GHG into the atmosphere. Leakage should be taken into account in any emissions quantification. Non-GHG externalities include effects on development issues such as social and economic or environmental issues, for example impacts on water, soil or biodiversity, and emissions of other environmentally damaging gases. The project must also identify and minimise any negative effects on environmental and development issues in the area of operation.

4. **Sustainable Development** Under the CDM there is a specific objective to assist developing countries achieve sustainable development. While international initiatives are trying to develop common guidelines no outputs have been produced to date.

5. **Verification, Monitoring and Certification** One of the key criteria in the KP is that the proposed project shall lead to*" real, measurable, and long-term benefits related to the mitigation of climate change."* Hence the project shall have to demonstrate in advance that the proposed reductions are realistically achievable, given the financial, management and infrastructure/technological constraints. Projects under JI and CDM must be validated and verified by an independent third party. Both verification and certification will require internal monitoring regimes to be in place as part of project management. While standards for evaluating ER projects are only beginning to be developed, a number of private sector companies have begun to verify emissions reductions under standardised procedures.

   It has to be noted that the above requirements can change and are not definite. Moreover, at a domestic level, additional requirements might be introduced.

5. Adaptation Levy

A mandate to use a portion of the proceeds from ER transactions (an adaptation fund) to assist those countries that are particularly vulnerable to climate change to adapt to those changes. Developed countries expect it to be 1-3% of the credit stream.

6. Administration Fee

The CDM Executive Board, who will have responsibility for the CDM approval process, are likely to be charged an administration fee. What this fee will be is undecided.

7. Host Government Approval

It is important to emphasise that some form of host government approval for ER transaction will doubtless be required. One implication of this is a demand from them for a share of ERs generated by projects. Some countries have put forth the public position that up to 50% of any resultant credit stream should remain in the hands of the host country, for their own sale or to be banked against any future emission cap that they might take on themselves. However, few countries are likely to be so aggressive, as such a position merely serves to disadvantage them in the marketplace against more trade friendly competitors.

5 EVOLUTION OF THE ENERGY-BASED EMISSION REDUCTION MARKET

5.1 Introduction

During the last ten years, energy-based ERs have evolved from a theoretical idea to a market mechanism for accomplishing global environmental objectives. While we are still a long way from an organised market with prices defined according to supply and demand, some evolution can already be seen, from the initial voluntary schemes and bartering transactions common in the early 90's to a market mechanism for accomplishing binding commitments agreed in the Kyoto Protocol.

This section provides an overview of the evolution of the markets and transaction mechanisms for ERs. Although the concepts and ideas are generic and applicable to any type of GHG mitigation option, we emphasise issues related to energy-based ERs, specifically those generated by energy efficiency, fuel switching, and renewable energy projects.

In the development phase, AIJ energy projects have tended to stem from government programmes. Energy projects have been developed for a number of reasons, many under development aid programmes, supplying grants.

5.2 Market history : UNFCCC and Decin (1992-1994)

In July 1992, the Framework Convention on Climate Change (FCCC) was agreed upon, resulting in a voluntary commitment by Annex 1 countries to stabilise their emissions at 1990 levels by the year 2000.

Embedded in the agreement was the concept of Joint Implementation (JI), the international development of activities to reduce GHG emissions or promote the absorption of atmospheric CO2. Although not officially endorsed by the convention, this promise of credit transfer through JI activities led a series of companies to engage in JI-type activities.

The Decin fuel switching project, launched in 1994, is generally viewed as the first Joint Implementation project under the FCCC. This project, approved by both the US Initiative on Joint Implementation (USIJI) and the Czech JI program, was a bilateral effort between the Czech city of Decin and a coalition of US energy companies to adapt a large coal-burning power plant to the use of significantly cleaner natural gas. In exchange for a $600,000 non-interest bearing loan, the US energy coalition would receive a percentage of the plant's ER credits for use under a likely future carbon trading regime.

5.3 Scandinavian early generation projects (1993)

While Decin can take credit as the first internationally recognised JI project, it is Sweden that is considered to be the world's first large-scale climate change player. Early renewable energy investments in Latvia, Lithuania and Estonia were started on good faith and only later registered under the nascent Activities Implemented Jointly pilot phase.

Table 1 Early Scandinavian Energy Projects

Project Name	Date Proposed / Initiated	Emission Reduction (1000 t C)	Host Country	Investor Country	Project Description
Balvi Boiler Conversion	1993	61,300	Latvia	Sweden	Renewable energy
Birzai Boiler Conversion	1993	113,660	Lithuania	Sweden	Renewable energy
Valga Boiler Conversion	1993	81,870	Estonia	Sweden	Renewable energy
Tartu-Aardla Boiler Conversion	1993	96,294	Estonia	Sweden	Renewable energy
Adavere District Heating	1994	2,581	Estonia	Sweden	Energy Efficiency
Balvi District Heating	1994	9,500	Latvia	Sweden	Energy Efficiency
Jelgava District Heating	1994	4,200	Latvia	Sweden	Energy Efficiency

The model of these initial transactions consisted of investor companies paying for the full costs of the activities in return for the promise of carbon credits generated as a result of these activities, should they eventually qualify under the regulatory framework. In general, investing companies paid for all or most of the project implementation costs, and usually claimed no benefit other than ERs.

It was still a long way from characterisation of CO2 credits as a commodity, since any interested parties had to first invest in their production process. The investment process was also rudimentary, usually project-based. Consequently, investments in this type of activity required full engagement in a project, from beginning to end. There was no liquidity associated with these investments or the resulting “carbon credits”. Very few services were available in terms of assistance for project development. Projects were designed and formulated with the assistance of consultants, academics, or NGOs, which did all the ground work of identifying partners, infrastructure needs, training requirements, negotiation with host country authorities and scientific scrutiny, as well as quantification and monitoring of emission savings. Development costs were consequently very high.

These tenuous commercial relationships led to a certain degree of dissatisfaction among participants. Combined with the underlying uncertainty about the possibility of credit transfer, this resulted in a relatively small number of projects and investment. An average of 3 new projects and US$ 110 million were committed yearly during the two years between UNCED and the First Conference of Parties (COP 1) in 1994.

5.4 The Netherlands and uncertainty during the AIJ Pilot Phase (1994)

At the First Conference of Parties to the FCCC (COP1, 1994), the Activities Implemented Jointly (AIJ) Pilot Phase was officially created, during which JI projects were to be conducted with the objective of establishing protocols and experiences, but without allowing crediting between developed and developing countries. However, because of this lack of real incentives for investor participation, the results of the AIJ pilot phase were not representative of JI’s full potential in terms of international investment and GHG reduction achievements. It was estimated that, once

fully operational, the international market for emission reduction projects credits or allowances would reach over ten billion dollars yearly.

In this new scenario, where companies were faced with even more uncertainty about the value of projects, a significant reduction in the level of investment in JI/AIJ-type projects was observed. Though project proposals continued to be submitted, yearly investment committed to JI projects decreased from US$ 57 to US$ 14.8 million and the willingness to pay for emission reductions also reduced.

While few investments took place during this phase, the supply of "potential projects" greatly increased, since JI was beginning to be perceived as a new source of capital. In this context, a call for proposals was organised by the Canadian electricity company Transalta and the World Business Council for Sustainable Development (WBCSD), which gathered tens of project proposals to be considered for investment in the future.

A new figure to emerge during this period was the Netherlands. Continuing the Northern European "greening" trend started by Sweden, the Netherlands quickly established itself as a major emission reduction player by financing a number of energy projects throughout Eastern Europe. Like the Swedish projects before them, these were undertaken on the assumption that an international system of emissions credit trading would inevitably arise in the near future.

Table 2 Early Dutch Energy Projects

Project Name	Date Proposed / Initiated	Emission Reduction (1000 t C)	Host Country	Investor Country	Project Description
Energy Efficiency Improvement by Hungarian Municipalities and Utilities	1994	240,000	Hungary	Netherlands	Energy Efficiency
Horticulture Project in Tyumen	1994	---	Russian Federation	Netherlands	Energy Efficiency
Sanitary Landfilling with Energy Recovery in the Moscow Region	1994	255,268	Russian Federation	Netherlands	Fugitive gas capture
RABA/IKARUS Compressed Natural Gas Engine Bus Project	1995	148,000	Hungary	Netherlands	Fuel Switching

5.5 USIJI projects and rising optimism (1995)

Although few transactions occurred during this period, there was a growing feeling that some form of JI with crediting would need to arise in order for developed countries to firmly commit to real targets. This attitude led to increased interest in the subject, manifested worldwide in many forms by economists, policy analysts and scientists alike. Multiple journals and Internet sites emerged devoted to nothing but Joint Implementation topics, as did innumerable papers, and books. A variety of consulting "experts" now worked with different clients, developing projects, products, positions, strategies and services. Businesses organised themselves by sector to look for investment opportunities and formulate lobbying strategies. These organisations included the Edison Electric Institute (an association of American electricity generation companies) and the Alliance to Save Energy. On the regulatory side, JI/AIJ bodies were formed in many countries, including USA, Canada, Netherlands, France, Germany, Switzerland, Norway, Australia and Japan.

It was in 1995 that the USIJI resumed its financing of energy projects, initiating the massive RUSAGAS project and beginning a long series of aid-based projects in Central America.

Table 3 Early USIJI Energy Projects

Project Name	Date Proposed / Initiated	Emission Reduction (1000 t C)	Host Country	Investor Country	Project Description
RUSAGAS: Fugitive Gas Capture Project	1995	30,955,750	Russian Federation	United States of America	Fugitive gas capture
Plantas Eólicas S.A. Wind Facility	1995	222,537	Costa Rica	United States of America	Renewable energy
Aeroenergía S.A. Wind Facility	1996	36,194	Costa Rica	United States of America	Renewable energy
Doña Julia-Hydroelectric Project	1996	210,566	Costa Rica	United States of America	Renewable energy
CESSA CO2 Reduction	1997	6,730,102	El Salvador	United States of America	Energy Efficiency

5.6 Australia, E-7 and the run up to Kyoto (1997)

In the year preceding the Third Conference of Parties (CoP 3, to take place in Kyoto in December of 1997), there had been great anticipation that major changes were imminent. Discussions during CoP 2 (Berlin, 1995) had determined that binding commitments were going to be a central point in CoP 3. The consequences of these commitments were unknown but could be manifested in the form of carbon taxes, quotas, caps, etc., all of which would carry significant costs to industrialised economies.

In this phase of uncertainty, a number of interesting moves were observed within many sectors not previously involved in this field. Oil companies started to invest in the diversification of their energy matrices, pushing the flow of capital towards renewable energy. This was clearly illustrated by the rising interest in solar energy and specific investments such as BP's US$ 1 billion commitment to the solar industry. Shell created its Shell Renewable International division, with an initial budget of US$ 500 million for forestry, solar and biomass projects. Large car manufacturers, such as Toyota and Mercedes Benz, invested heavily in car models with lower GHG emissions, including a fuel cell prototype. The International Automobile Association, the organisation responsible for Formula One competition, decided to offset the GHG emissions of their events. The insurance and re-insurance sectors took climate change into consideration, and formed a group under the auspices of the UNEP. It became obvious that third-party certification would be instrumental in the validation and credibility of these new transactions.

Australia, a long-time participant in the greenhouse policy debate, began its climate change activity in earnest with the formation of the Australian Greenhouse Office (AGO) in 1997. As with Sweden, the Netherlands and the US, Australian energy project investment began in neighbouring countries and gradually expanded out of Oceania to Mauritius and Chile.

Table 4 Australian Energy Projects

Project Name	Date Proposed / Initiated	Emission Reduction (1000 t C)	Host Country	Investor Country	Project Description
Air Conditioner Energy Conservation Program for the Solomon Islands	1997	13,850	Solomon Islands	Australia	Energy Efficiency
Grid Connected Photovoltaic Project	1997	13	Fiji	Australia	Renewable energy
Fuel Efficiency Improvement at a Power Station in Mauritius	1999	1,000	Mauritius	Australia	Energy Efficiency
Chile Natural Gas Project	1999	5,200,000	Chile	Australia	Fugitive gas capture
Micro-hydro "The Village First Program"	1999	1,366	Solomon Islands	Australia	Renewable energy
Performance Monitoring of Solar Systems	1999	2,080	Mauritius	Australia	Renewable energy

Another notable player to emerge during this era was the E-7, a global association of large electric utilities that had formed in the mid 1990s. The E-7 is notable for being one of the first industrial coalitions to sponsor multiple AIJ projects and for bringing commercial investment into a field (energy-based ER development) traditionally dominated by government investors.

Table 5 E-7 AIJ Energy Projects

Project Name	Date Proposed / Initiated	Emission Reduction (1000 t C)	Host Country	Investor Country	Project Description
Renewable Energy Training/Demonstration Project	1997	1,300	Indonesia	Australia	Renewable energy
Improving Thermal Power Plant Efficiency	1997	---	Jordan	---	Energy Efficiency
Mini hydro power plant at the Manyuchi dam in Zimbabwe	1997	126,578	Zimbabwe	France, Canada, Germany	Renewable energy

5.7 Kyoto and its Aftermath (1997-present)

In December 1997, the Kyoto Protocol was agreed, with the adoption of binding commitments by 37 developed countries and economies in transition to reduce their GHG emissions in an average of 5.2% below the year 1990 during the years 2008-2012. At the same time, the Protocol approved the concept of a Clean Development Mechanism (CDM), a new mechanism resembling JI, which allows for the creation of Certified Emission Reduction (CER) credits in developing countries. Another important output of the agreement was the recognition of forestry activities as valid options for reducing net concentration of atmospheric GHGs, in articles (3 and 6) of the protocol.

The establishment of binding commitments led to a more real demand for emission reductions. It is estimated that the total cost of reducing GHG emissions to the levels stipulated by the Kyoto

Protocol is in the range of several billion dollars a year. According to the UNCTAD, if these targets were partially accomplished through GHG emissions trading, this would generate a demand for GHG Emission Reduction Units (ERUs) to the order of US$20 billion a year, a substantial increase from the previously voluntary demand of the pre-Kyoto era.

Following the endorsement of the emissions trading concept, there has been an immediate response in the still incipient ER market. In the eight months before the Kyoto Protocol, a variety of initiatives were created within the private sector, such as British Petroleum's announcement of a voluntary internal emissions cap and its creation of an internal trading system.

The supply of carbon offsets has instigated more internal organisation and offer more sophisticated financial instruments. This is the case of the Costa Rican national programme, the first to produce carbon denominated securities (CTOs – Certified Tradable Offsets) which have been traded over-the-counter in some brokerage houses in the Chicago Board of Trade. This system has been followed by New South Wales State Forests, a state organisation that sold the carbon sequestration services of some of its plantations as CTOs to Australian power companies in late June 1998.

At the same time, the World Bank announced its intention to launch the first carbon offset investment fund, the Prototype Carbon Fund (PCF). This had an initial capitalisation of US$ 150 million, is now fully subscribed, with contributions from five countries and 19 private concerns, and is designed to catalyse the CDM and JI project investment markets. The PCF expects to negotiate a risk-adjusted price of $2-5/t/CO2. Only commercially available technologies are financed. The PCF will provide no less than 2%, no more than approximately 10% of the funds assets for any one project.

The Dutch Government recently launched the ERUPT emission reduction tendering programme as part of the Government's strategy in meeting its greenhouse gas emission reduction targets. The programme will purchase ERs if the minimum size of the project is 100,000 tonnes of CO2-equivalent per annum, and if the project would not take place without JI-funding. ERUPT will pay in advance of project start-up for the ERs. The available budget is 37 Million Euros.

As supply and demand becomes more organised, it has become apparent that market mechanisms and supporting infrastructure must also be developed to support the expected volume of transactions. This has led to a number of new initiatives, such as the creation of a GHG emissions trading mechanism organised by UNCTAD; the announcement by the International Petroleum Exchange and British Petroleum of their intention to create an international GHG emissions trading system based in the UK.

5.8 Ways forward

Irrespective of the ongoing policy debates surrounding JI/CDM mechanisms, post-Kyoto investment flows steadily increased to emission reduction projects under the AIJ Pilot Phase, with an ever-increasing degree of sophistication in the financial aspects of transactions. In part, this has to do with increasing private sector involvement in the emerging CDM market, not just in their principal role as project investors, but also as certifiers, transaction brokers, investment advisors and insurers. The original conceptualisation of the JI/CDM mechanism involving bilateral, jointly-implemented projects between two defined parties with a formal exchange of resultant ERs is rapidly evolving to that of a multilateral market in which the full range of financial products used in other investment scenarios are being applied. Examples include:

- supply-side market placements of ERs;
- forward sales or options contracts for ERs;
- bonds designed to stagger the release of ERs during the commitment period;

- specially-tailored insurance products to address the various scientific and policy uncertainties and risks unique to emission reduction projects;
- equity-based ER investment vehicles;
- pilot schemes to integrate ERs into emission permit trading schemes.

Suppliers (renewable energy concerns, countries or companies) will have to learn about this new commodity (or service) generated by their enterprises (activities), and adapt to a new production possibility boundary based on the relative values of their main output (energy) and of this new environmental value (emission reductions).

Modelling work by the World Bank suggests that the aggregate costs to Annex B Parties of implementing their Kyoto commitments would be around US$180 billion a year in a no-trading scenario, reduced to US$16 billion with full global trading, which gives some idea of the potential size of the market.

6 FINANCING ELECTRICITY SECTOR PROJECTS

6.1 Introduction

This Section provides an outline of the main methods, analyses and processes applied in financing electricity sector projects. It provides the context for Section 5, which deals with how the ERs from electricity projects impact upon financing and also how they can be structured into a project finance package.

Section 6.2 deals with the types of finance used in projects, and Section 6.3 reviews and outlines the role of the key project participants in the financing process. Section 6.4 discusses financial viability. Section 6.5 looks at the methods of financial assessment. Section 6.6 examines risk and risk mitigation. Section 6.7 examines the financing models that are most likely to be adopted in electricity sector projects.

The table below shows the main phases in a typical electricity sector project cycle. All of these phases are relevant when evaluating and securing finance and will be discussed in this Section.

Table 6 Conventional Project Cycle

1. Feasibility Assessments:
• Project design
• Technical feasibility
• Business plans & Financial modelling
• Identify partners & project vehicle
2. Project & Finance Structuring Phase
• Contracts: construction, fuel/technology supply, power purchase or energy performance agreements etc • Govt permits: planning permission, emissions permits etc • Arranging finance and signing agreements: grants, loans, equity, risk management and mitigation
3. Construction/Implementation Phase
• Construct or upgrade plant/facilities, or implement energy management strategy
4. Operational Phase

6.2 Types of Finance

In general there are three sources of finance that can be used to develop projects – loans, equity, and grants. Most projects will incorporate a varying mixture of loan and equity sources of finance, with some commercially marginal enterprises utilising government grant programmes.

Loans or debt: Amount of money provided by a third party. The borrower has to repay the loan after or during its agreed term plus interest for the period of borrowing. Banks provide the majority of the loans/debt and generally finance up to 70-80% of the project cost, depending on the project forecast cash flows. There are several types of loans. Generally a distinction can be made between:

- **Senior loans or debt.** Loans usually provided by large international banks. These will generally be secured over the assets of the project and be amortised over the life of the loan.

There may be a number of different loan types and maturities within a particular project. Senior loans rank highest in priority for repayment and thus are the lowest risk of all the financing instruments. Thus they generally represent the cheapest source of capital. They are based on interest rates prevailing in the market for the currency in question, plus a spread. The spread depends upon the perceived risk of the project but is generally in the range of 1-3%. Interest rates may be fixed or floating although many lenders require that projects hedge at least some of their interest rate (and currency) exposure.

- **Subordinated loans or debt.** Loans which come in priority of payment after senior debt and before equity. Subordinated debt retains the essence of debt while incorporating attributes of equity (FCPG, 1993). It plays a role of bridging the gap between what senior lenders are prepared to provide and how much equity is available for a project (FCPG, 1993). As they rank lower for repayment they represent a higher risk, which requires a higher return. There are wide ranges of spreads above the reference interest rate for subordinated debt depending on a number of factors and typically could be between 3-20%. Sub loans are also sometimes given a "kicker" in the form of equity options or warrants and sometimes used as a more tax effective form of equity by providing a similar rate of return as equity to the investor whilst being tax deductible by the borrower.

- **Loans or debt with low interest.** Loans with a lower interest rate provided by multilateral banks, which have established programmes to pursue particular policy objectives for which they were established.

Equity: A method of raising capital in which shares and thus ownership are exchanged for a price. This is the highest level of risk and therefore the expected returns for equity holders are higher. Depending on the project, equity holders will generally seek real returns in the range of 15-25%. The equity provider shares in the revenues of the project company and can sell his shares in the project in the future. Equity finance is an activity carried out by project sponsors, banks, and a range of other commercial enterprises. The main feature of equity financing is that the provided capital does not have to be paid back by the project. Returns on equity are obtained either from dividends, that can only be paid out of post-tax profits, or from the sale of shares. Generally, equity financiers only cover part of the project costs and seek to leverage their returns through increasing the amount of debt in the project finance structure. This means that additional financing must be sought through loans.

Grants: Amount of money provided by a third party to a person or organisations executing a project that contributes to the objectives of the third party. In general grants do not have to be repaid (provided the project is executed as planned) and are mainly provided by government organisations. Most grants only pay a percentage of project costs meaning that additional ways of financing have to be found.

6.3 Parties Involved in Financing a Project

A brief outline of the main parties and the project cycle involved in any project illustrates the complexities involved in structuring finance for a project. The key participants in a project will be scrutinised by potential lenders and investors. The role of certain parties and their experience in the field is crucial in securing finance. The key parties involved in a project are (Denton Wilde Sapte, 2000):

- **Project Company:** Often a Special Purpose Company (SPV), set up as a joint-venture, or a limited partnership, particularly where limited recourse finance is being sought.

- **Sponsors:** Sponsors are those individuals or companies who promote a project and get the project underway. They are often a key project participant, such as the owner of land on which the project is located or one or more of the contractors. They are invariably an equity investor in the project/project company, although often through "in-kind" contributions. A commercially strong sponsor or partner in a joint venture is vital in securing loans from lenders.

- **Constructor:** Construction contractors will usually have responsibility for the completion of the facility, and will have to assume liability for finishing construction on time and to budget. The lenders will pay particular attention to ensuring that these risks are covered, and will generally require constructors with a track record in the field concerned.

- **Operator:** The operator of the project may be the project company itself, one of the sponsors or a separate company appointed in this capacity. The lenders will prefer an operator with a proven track record in managing similar projects.

- **Supplier:** Companies supplying essential services and goods such as fuel and equipment. The lenders will prefer supplier agreements and contracts to be in place. Equipment suppliers will generally be required to provide performance guarantees for the equipment they supply. Limited recourse financing is most appropriate where the equipment/technology is tried and tested. If the technologies are new, venture capital, which has a higher cost is more appropriate.

- **Purchaser:** This will be the purchaser of the output from the project. In the context of generation projects this will be electricity and/or heat. For demand side energy efficiency projects the output would be the energy saved. The lenders will prefer a power purchase[6] or energy performance agreement to be in place. But for these agreements to have any weight with the lender, the purchaser will have to be credit worthy and have a good track record.

- **Lender**: A project may be financed through debt, and one or more banks usually provide this. The banks are also often involved in underwriting all or part of the loan. There is often a bank from the host nation involved in any deal. With a syndicated loan, the loan is arranged with a group of banks, usually one the larger banks. One of the banks will be appointed to manage and administer the loan on behalf of the syndicate, and is called a Facility Agent. Another bank, called the technical bank, is usually appointed to deal with the technical aspects of the financing, such as documentation. There are also insurance and account banks that deal with insurance and project cash flows respectively.

  The lender is likely to require that the project model demonstrate that the loan can be repaid within the lifetime of the power purchase or energy performance agreement.

- **Third-Party Equity Partners:** Unlike sponsors who are usually equity providers these third parties are involved in the project for the benefit of their shareholders, and will therefore want to ensure that the project revenues delivers the return on their investment as laid out in the business plans.

- **Multilateral Agency:** The multilateral agencies, such as World Bank agencies and regional development agencies (the European Bank for Reconstruction and Development (EBRD) for Central and Eastern European countries, are involved in financing projects. These agencies are also involved in equity funds in certain cases. The agencies are able to provide loans, and risk mitigation products to provide projects with protection against certain types of risk. The

[6] Also referred to as sales/off-take agreement.

involvement of these entities is often seen as particularly important in more risky countries as they, as a consequence of their other lending to the country concerned, are seen as being particularly influential with the host government.

- **Export Credit Agency (ECA):** The ECA provides loans, insurance and guarantees to exporters and overseas governments. Some ECAs lend money directly to assist exports. Insurance can be arranged against political risk, and in some cases commercial risks, currency movements, and to provide interest rate support. Guarantees can be provided to project lenders.

- **Insurer:** The insurers will provide cover against losses from insured events. Lenders prefer the insurer to be one of a good financial standing.

- **Experts:** The lenders and some equity investors may ask for external experts to advise them on certain technical, engineering, environmental and risk aspects of a project. These parties can play a key role in determining whether a project is viable or not.

- **Host Government:** The role of the host country varies but is likely to involve the issuance of consents and permits necessary for the project to commence. In some countries, the government may be involved through state owned or controlled companies involved in the project structure. Its attitude to foreign direct investment is crucial for projects trying to attract capital.

6.4 Financial Viability

When a project is being designed one of the first and most important priorities is to determine whether a project is financially viable. This means that the project must demonstrate acceptable returns for the level of risk being assumed for each of the participants, whether equity providers, lenders, operators and others. Financial analysis is the main means of demonstrating viability and we examine the main measurement methods and tools.

A project can only be financed if, under the ranges of assumptions provided, the results indicate that its revenue or cash flow streams will be sufficient to cover all expenditures, whilst leaving a reserve for unexpected events. For a project to be financially viable it will have to generate sufficient cash flows to meet all expenditures including (Wide Sapte, 1997):

- Design, construction and operating costs;
- Debt service and financing costs;
- Taxes;
- Royalties;
- Professional fees;
- Contingency needs – reserves (a sufficient difference between cash flow and expenditure) for contingencies such as demand or exchange rate fluctuations in order to leave sufficient surplus to provide the shareholders with a satisfactory return on their equity investment.

The cash flow from the first few years of a project's operation are generally the most important in determining whether the project is viable or not. This is because most projects assume a degree of inflation, and contracts within them are priced accordingly. Debt costs however are often fixed, and often the higher the level of inflation assumed the more viable a project appears. Lenders will want to see a robust and predictable revenue stream that is secured to a date some time after the intended final maturity of the loan (Wilde Sapte, 1997). Future cash flows are discounted at an appropriate rate to determine their net present value.

6.5 The Financial Assessment Process

The financial assessment process is a standard methodology for evaluating project viability. Prospective financial partners and, in particular, lenders will require such assessment and the decision to back the project will depend on the outcome of it. The main components of such assessment are:

1. Development of the project model
2. Financial indicators
3. Sensitivity analysis
4. Risk assessment and mitigation

6.5.1 Development of a project finance model

The financial model is the centrepiece of the financial assessment process. Most models are structured in a similar way and will have the following features, assuming the use of a typical spreadsheet software package (specific project finance packages are also available).

1. **Assumption sheet**. This holds all the input variables that will drive the model. Each of the assumptions used is referenced to a "bible". This is a document that contains the source of all assumptions used. These might be expert opinions, forecasts, technical performance specifications, power purchase prices, fuel costs or other sources. This enables lenders and investors to assess whether the assumptions used are reasonable.

2. **Calculation sheets**. This is the engine of the model. It undertakes the calculations necessary to provide the information in the output sheets. It is developed as a separate sheet in order that the methodology may be visible. Within this may be a number of sub sheets that perform a number of different calculations that themselves feed into the overall calculation. These would normally include:

- Tax calculations;
- Depreciation and amortisation schedules;
- Loan balance and interest payment calculations;
- Revenue and operating performance.

3. **Output sheets.** These are in effect pro forma financial statements for the project company and generally will comprise

- Cash flow statement;
- Profit and loss;
- Balance sheet;
- Debt and interest ratios.

The most important of these to lenders is the cash flow forecast. It is generally the position that cash is tight in the early years and that the borrower is bound by a number of covenants as to the minimum financial position of the company. In the event of a breach of covenant the lender is entitled to step in to take possession of the assets over which it has security. However, in practice this only occurs in dire financial circumstances and the normal consequence of a breach of covenant is for the management to find a way of remedying it. One possibility is for the terms of the loan to be renegotiated or restructured.

6.5.2 Financial Indicators

The output sheet will demonstrate the viability (or otherwise) of a project by reference to a number of indicators. The relative importance of these differs between providers of debt and equity, although the principles of assessment are broadly similar. The most important of these are:

1. **Project Internal Rate of Return (IRR) and Net Present Value (NPV).** This is the IRR of the project itself and is independent of the way the project is financed. Although these two concepts are similar, there are important differences in how they are interpreted. At a minimum a project will need to show a positive IRR and NPV. The project IRR should generally be above the prevailing long-term interest rate in the currency in which the project is being financed (otherwise it would be more worthwhile to put the finance on deposit in low risk government bonds).

2. **Equity IRR.** This is the rate of return to the providers of equity, after taking account of the cost and repayment of finance. Equity holders can only receive their returns out of post tax profits (or sale of their shares) and generally are not entitled to receive dividends until after certain debt repayment milestones have been achieved.

3. **Earnings before Interest, Tax, Depreciation and Amortisation (EBITDA).** This is the closest representation of the cash flow of the project. This may well be negative in the early stages.

4. **Interest Cover Ratio.** This is the ratio of EBITDA to interest payments and represents the ability of the project to meet its minimum financing costs (before taking account of repayment provisions). A normal interest cover ratio covenant would be at least 125% although this is negotiable and will be higher in riskier projects. The application of these generally commences after completion of construction.

5. **Debt service ratio.** This is the ratio of EBITDA to all debt servicing requirements (including repayment obligations). In general this is lower than the interest cover ratio as lenders have some flexibility to defer repayments. Indeed, in practice, loan repayment structures are usually designed such that the specific cover ratios that lenders require will be met if the forecast performance is achieved. The structuring might include interest payment deferrals, capital repayment holidays, and stepped (rising) interest rates over the course of the loan.

6.5.3 Sensitivity Analysis

Provided that the project can demonstrate initial viability in that it has an acceptable IRR, that it can meet the covenant requirements of lenders, and that it is likely to provide equity providers with a return, then a detailed sensitivity analysis is undertaken.

The purpose of this exercise is to establish which of the model assumptions affect the financial outcome the most i.e. to identify the key variables that, when changed, have the greatest financial consequences. As the number of input variables is usually in excess of 50, it is not unusual for there to be up to 200 model runs to test different combinations of changes in input variables.

Generally however the most important variables are contractually hedged to reduce risks to lenders. The most important of these are:

- Power purchase price (fixed)
- Fuel supply, and fuel supply price (often fixed)
- Interest rates (usually partially hedged in financial markets)

Inflation is generally one of the most important variables as it can affect interest rates in due course, where interest rates are fixed, high inflation increases nominal revenue and enables early debt repayment.

Provided that the model demonstrates that under adverse conditions the project still provides an acceptable (although lower) rate of return and that it is not unduly subject to particular unmanageable risks then the lenders would move to examine each of the risks and their likelihood in more detail. Risk assessment and management is discussed in more detail in the following section.

6.6 Risk Assessment and Management

One of the key elements in financing projects is the management or mitigation of the project and other risks. Lenders and investors will pay attention to these issues.

6.6.1 Type of Risk

Conventional project risk can be divided into pre-completion and post-completion types:

A. Pre-Completion risks:

- **Time Overrun:** The risk that the contractors fail to either deliver or construct infrastructure by agreed points in time. This risk can be transferred through monetary damages for delays in delivery or completion, and is payable by the contractor/equipment provider.

- **Capital Cost Overrun:** The risk that the costs involved in establishing the project overrun from those projected in plans. This can be mitigated through arranging fixed-price contracts.

B. Post Completion risks

- **Technology:** The risk that the equipment does not perform according to a pre-agreed specification. This can be transferred through monetary damages for performance shortfall.

- **Market:** The risk that there is an assured market. This can be mitigated to a large extent through favourable terms in a Power Purchase Agreement.

- **Political and Legal:** The risk that a country is stable enough economically and politically so as not lead to a failure of the project or a diminishing of revenues from it. Examples would be expropriation or nationalisation by a government. This can be mitigated through insurance and guarantees.

- **Operating:** The risk that the project will not perform to planned performance. The operators could guarantee a certain level of performance, or insurance markets might cover certain events affecting a project.

- **Fuel or Product Supply:** The risk that the products or fuel supply cannot be maintained. This can be mitigated through supply contracts where both quantities and prices are fixed.

- **Financial:** The risk that interest rates, exchange rates or commodity prices may adversely affect financial returns. This can be mitigated through products supplied in the financial markets to hedge interest rate or currency risk, or through the respective supply or off-take agreements.

6.6.2 Assessing Risk

An assessment of the risk that the project and the key parties will be exposed to should be undertaken as part of the project planning process. Risk assessment is generally undertaken by following the following steps:

a) **Risk Identification:**

Identification of all risks associated with the construction and operation of a project. Typically this is undertaken by expert risk analysts (often by insurance companies involved in the project). The list of risks, and their consequences will often run to 15-20 pages.

b) **Risk Matrix:**

This plots all categories of risk against the various phases of a project. This can form the basis for the negotiations as to which project parties will absorb the various risks.

c) **Quantitative Assessment:**

At this point, risks have been identified, with those most probable to lead to non-performance delineated and discussed. A framework can be produced to evaluate key risk parameters for individual JI/CDM projects. The quantitative assessment uses hard data, when applicable, as well as qualitative professional judgement. The output is sometimes in the form of a calculated risk index. Indices are designed to be relative, in other words, as a way of comparing the potential impact of risk from one JI/CDM project with another.

The risk assessment methodologies are based on several parameters and can be applied in a number of quantifiable ways:

a) The likelihood of an event occurring (L): Past records combined with professional judgement are used to estimate the possible impact of an event on the expected outcome of a project.

b) The significance of its impact, were it to occur (S): Past records combined with professional judgement are used to quantify the impact that an event could cause during the lifetime of the project.

   Absolute Risk is the product of **{ L x S }** and is a measure of risk posed by a specific event without any countermeasures being taken.

   The assessment is modified to discount the absolute risk impact by a factor reflecting the intensity and quality of risk management currently applied by the project to avert the event's occurrence or to minimise its impact. A quantified risk factor is an adjustment to Absolute Risk to produce an output called Quantified Risk. Further variables are incorporated as defined as follows:

c) The risk response or risk management procedure (P): In order to reduce a risk or its impact, managers may establish countermeasures in the form of operational procedures. The technical adequacy of such procedures is evaluated making use of past records and the best professional judgement.

d) Management systems (MS); The success of such measures in addressing risk including communication, monitoring and actual success.

Therefore the level of Quantified Risk posed by each potential threat can be calculated according to the following formula:

Quantified Risk = **{L x S} x {P x MS}**

Obviously some risk categories lend themselves to a more quantifiable approach such as failure to demonstrate offset gains, natural risks, leakage, and slippage. Other such as ratification of the Protocol, eligible activities, credit sharing, can still be put into this framework using "soft" data such as expert opinion based on interpretation of current events and trends.

6.6.3 Managing Risk

The risk that a project will not perform or under-perform can be managed through:

1. Allocation of a specific risk to a contracting party who will guarantee the particular project activity, in the construction or operational phases. Generally, in order to bear and manage risks, it is necessary to understand them. The entities best able to do so are those most closely associated with them. Guarantees could be provided in relation to supply of fuel or equipment, payment on delivery of electricity or energy savings, performance and arrival on time of equipment, etc.

   Guarantees will only work, in terms of convincing investors, lenders or even output purchasers, if the parties involved have a good credit rating and track record in their allocated responsibilities.

2. Transferral to a third party. The transfer of risk to a third party will involve the use of financial tools, such as hedging, guarantees and insurance products. Financial hedging techniques use derivative markets to fix future prices of commodities, currencies and interest rates. Insurance allows for the transfer of a particular risk by paying a third party. The third party is able to bear this risk because they are able to combine a large number of similar unsystematic individual risks to increase the predictability of the risk occurrence. Insurance can be used to mitigate political risk of foreign direct investments from public and private companies. Agencies such as the World Bank's Multilateral Investment Guarantee Agency or the UK's Export Credit Guarantee Agency (ECA) provide political risk insurance and guarantees.

6.7 Financing Models in the Electricity Sector

This Section examines the finance models that are likely to adopted in financing electricity sector projects. These can be divided into new and retrofit energy generation projects and demand side energy efficiency projects. The generation projects are usually financed through what is generally known as Limited Recourse, and sometimes through Corporate. Demand side energy efficiency projects are typically financed through the Corporate/On-balance sheet financing model, as well as through add-on facilities.

6.7.1 Financing New and Retrofit Electricity Generation Projects

Most energy projects are highly capital intensive and will require the developer to raise significant amounts of finance. In general, there are two techniques used to finance electricity generation projects, limited recourse financing and corporate financing.

6.7.1.1 Limited Recourse Financing

Limited recourse financing or project financing (also known as the BOOT - Build Own Operate Transfer) model is a technique, whereby a significant part of the project financing is provided by way of debt and is solely repaid out of the assets being financed and their revenues. There has seen a huge growth in limited recourse financing in Europe, the United States, South-East Asia and farther afield (Denton Wilde Sapte, 2000).

Although more expensive than corporate financing, this method is seen as attractive for several reasons. As most energy projects are highly capital intensive, the growth in the sector would otherwise have been beyond the ability of many companies to finance internally. This method therefore keeps projects off companies' balance sheets and diversifies access to capital. The second advantage is that debt can be used to leverage the returns on equity to the project developers as debt generally has a lower cost of capital than equity.

The principal feature of limited recourse finance is that the lenders to the project have recourse only to the cash flows from the project itself for repayment, rather than to the general resources of the sponsor. The lenders and equity investors will pay close attention to how the risks are managed. Within limited recourse financing the aim of the developer/sponsor is to allocate risks to those best able to bear them.

The loans are secured largely against the future cash flows, concessions, rights and agreements rather than just the physical assets of the project. Since financiers are lending money to the project developer based to a large extent on the future cash flows, they will require as much certainty as possible that the cash flows will be achieved. This is largely achieved through contractual arrangements with all the major project participants – equipment suppliers, construction contractors, project operators, fuel suppliers, and power purchasers (FPCG. 1993). Thus it would be normal that at a minimum:

- fuel supplies are secured by a fixed price supply agreement for the financing period;
- Sales of electricity are through an agreed power purchase contract with a reputable entity;
- Operating performance is guaranteed through performance standards for the operator;
- Equipment performance is guaranteed by the supplier;
- Financial risks are hedged.

In the event of any of the risks being realised, the financial compensation from the non-performing party should be sufficient to ensure that lenders are repaid.

One of the key requirements that lenders have in relation to limited recourse finance is that the project has a financially strong sponsor. In general a strong sponsor could be considered to be one that has significant resources and experience in establishing similar projects. Although it is not obligatory, it is generally preferable that the sponsor should have the capacity to step in to financially support the project in the event of under-performance, and possibly would do so, if only to avoid reputational damage. In cases where an applicant is not a financially strong sponsor it is often sensible to enter into a joint venture with a partner who meets this requirement.

Lenders will take security over the project assets and contracts. This gives the lenders the ability to control the project and even take over the operation of the project where the project is not repaying its debt in accordance with the loan agreement The most common ways of taking security are:

- Assignment of priority rights to the project cash flow;
- Mortgage/fixed and floating charge over the physical asset;
- Assignment of the project contracts;

- Contractual undertakings (construction, fuel, operation and power purchase agreement);
- Shareholder undertakings;
- Insurance, and assignment of insurance interests;
- Bonding;

(Wilde Sapte, 2000)

- "Step In" operating rights.

Limited Recourse financing works well where there are financially strong project sponsors with a track record in the sector and country concerned, using tried and tested equipment and technology. Accordingly this makes it difficult to apply to new energy technologies or to projects that have parties with a poor credit rating or track record.

6.7.1.2 Corporate Financing

The options for a project proponent who is unlikely to meet the criteria for limited recourse financing is to:

1. consider a joint venture with a stronger proven partner, who is more likely to be able to raise finance through the limited recourse technique;
2. consider on balance sheet corporate financing.

Corporate financing, or what is also known as on-balance sheet financing, is the use of internal company capital to finance a project directly, or the use of internal company assets to obtain loans or other funding from banks or investment funds. The use of equity to finance projects has the disadvantage of being expensive, in terms of the cost of capital, and is often tax inefficient, and it generally dilutes the control of the company by introducing new investors.

The use of assets to secure loans is often referred to as 'on balance sheet' financing, and is usually a cheaper, simpler and more flexible approach to financing projects (ETSU, 2000). However, the project sponsors are often required to take on many of the project risks, as transfers are more limited in this technique.

If loans cannot be secured, then capital can be raised from investment or venture capital funds which can be used to finance a company's expansion plans i.e. the plans will focus on or include the project(s) that need financing.

Securing either loans or equity, from banks or investment funds, for the development of a company will require:

1. A well drafted business plan for expanding or even establishing a company business;
2. A strong management team with a proven track record, preferably in the power sector;
3. The projects are commercially viable.

Corporate financing is less preferential than limited recourse financing because both all internal capital and assets are at risk should a project fail to deliver the projected revenues, and a company's ability to borrow is finite. However, for small or new operators, this form of financing is one of the few options available, because they fail to meet the demanding criteria by which lenders will accept projects for limited recourse financing.

6.7.2 Financing Energy Efficiency Projects

Energy Efficiency (EE) projects, where energy savings are made on the demand side of the electricity sector, are generally wide in potential application, but small in scale, and have

significant emissions reduction potential. Lenders are generally more interested in providing debt to larger scale projects because for a similar amount of work, the potential returns are greater in absolute terms than for smaller projects. This has made EE projects traditionally difficult to finance. However, there are a couple of techniques to overcome this bias. These techniques are (EBRD, 1997):

1. Corporate financing.
2. Add-on facilities.

6.7.2.1 Corporate Financing of an Energy Service Company (ESCO)

The financing of an Energy Servicing Company (ESCO) is similar to the financing of any small to medium sized enterprises (SMEs) and the same as corporate financing techniques, outlined in the previous section.

Finance is provided to an ESCO based on revenue secured in an Energy Performance Contract (EPC). The revenue from demand side energy efficiency projects is generated from the future energy savings that result from the implementation of installing new technology or equipment. The ESCOs identify energy savings in municipal, commercial or industrial facilities, implement an energy management plan, and receive their remuneration according to the amount of savings in the use of electricity they achieve for their clients according to the EPC. Since the energy efficiency projects tend to be small scale they are packaged together and EPCs are signed with a number of clients.

Institutions will provide loans, equity or dedicated credit lines to ESCOs based on revenue streams from the energy savings projected from a number of energy efficiency projects. The client's ability to pay, based on its credit ranking and its commercial track record, will be crucial in convincing the potential investors in an ESCO that the revenue streams can be delivered.

Both lenders and equity investors will require the sponsors of the ESCOs to be financially strong and have a track record in energy efficiency project development. In general ESCOs are subsidiaries of large energy companies.

The ESCO finance model has been successfully implemented in the USA and Western Europe and is beginning to be implemented in the CEE countries. Development banks such as the European Bank for Reconstruction and Development have pioneered this type of financing in the CEE countries because of the lack of private sector interest in such projects, and the demand from their investors for action in the demand side energy efficiency field.

6.7.2.2 Add-On Facilities

This facility involves the incorporation of energy efficiency project(s) into the retrofit or restructuring project which makes it better able to secure loans from lenders. The loan for the energy efficiency project becomes part of a much larger loan. An example of this would be the replacement of district heating boilers with more efficient ones, which requires a sizeable loan combined with energy efficiency components such installing insulation, and valve and metering technology, into the facility that would receive the re-powered heat.

7 JI, EMISSION REDUCTIONS AND FINANCING

7.1 Introduction

This Section examines how ER revenues can be incorporated into the financing structure of JI electricity sector projects. The conventional financing techniques were outlined in Section 4. The ways in which the ER component can fit in with these techniques is discussed in this Section.

Section 5.2 explores how the ERs can be incorporated into the financing models currently used in electricity sector projects. Section 5.3 discusses the implications of ERs for the key project participants relevant to the financing of a project. Section 5.4 looks at ERs impact on financial viability. Section 5.5 examines the risks related to ERs, and how these can be assessed and managed.

In the discussion we differentiate between two types of carbon transaction. Transfers are transactions in ERs that already have been achieved, or Assigned Amounts. Put another way a transfer results in a change in the content of a national registry. Trades are transactions either in the future or in emission reductions that do not yet exist (or have not been either allocated or certified). An example of this would be the purchase of all the emission reductions from a project up front (in anticipation of them being achieved).

In the case of JI the transfer that ultimately takes place according to article 6 of the Kyoto Protocol is a transfer of Assigned Amount. Accordingly for a JI project we view ERUs as being equivalent to Assigned Amounts.

The likely project cycle phases for JI emission reduction projects are outlined below in Table 7. This has been established from the evolving policy framework discussed in Section 2.

Table 7 JI/Emission Reduction Project Cycle

JI/Emission Reduction Project Cycle
1. Feasibility Assessment: • Emission Reduction Analysis: Policy and baseline assessment; • Emission reduction quantification & value assessment; • Incorporation into project business plan and financial analysis.
2. **Registration:** • Preliminary indication from host Government, and investor Government where appropriate, that the project will permitted under JI regime; • Letter of intent or MOU between host & investor country/party, and possibly with international body (UNFCCC Executive Body).
3. Monitoring and Verification Plan
4. Validation: • Validation of emission reduction case by case basis by an accredited body (Operational entity).
5. **Sale of ERs:** • Carbon / Emission Reduction Purchase Agreement (CPA/ERPA); • Includes risk mitigation, legal work, sales fee.
6. Monitoring and Verification: • Monitoring of emission reductions/project performance; • Periodic certification of emission reductions by accredited body (operational entity).

7.2 ERs and Electricity Sector Project Financing

In Section 4 we examined the financing models and procedures for both conventional electricity generation and energy efficiency projects. In this section we will explore these models and see how the ERs can be incorporated into the financing structures of the different project types.

For new and retrofit electricity generation projects the most common financing technique is limited recourse financing. In limited recourse financing the financial viability is determined by reference to cash flows that are contractually provided for. In this respect the cash flows from the ER component are no different. In order to take account of the ER value in their financial assessment, lenders will require that firm contracts are in place with all major project participants

and this will include the ER purchaser, probably in the form of a carbon purchase agreement (CPA). The CPA can in many ways be seen as similar in nature to a PPA. Even in corporate financing where loans and equity are secured on the companies assets as well as company cash-flows, if the additional ER revenue can be demonstrated through CPAs, better terms or more limited liability arrangements can be adopted, thus encouraging market development.

In demand side energy efficiency financing, the two finance models identified were corporate financing of energy service companies (ESCOs) and add-on facilities to large generation projects. With the corporate financing of ESCOs the company will have to secure energy performance contracts (EPCs) from a number of clients (energy efficiency projects tend to be small in cash-flow terms) after which the institutional lenders will provide equity and debt to the ESCO. If the ESCOs can also secure CPAs these types of projects are likely to be more attractive. This might also apply to the add-on facilities, which by their very name suggest that they are non core, and with which the developers are not primarily concerned.

In the following sections we explore:

- which additional parties should be involved in the carbon component of JI projects;
- the impact on existing parties to the project of the carbon component;
- how and if carbon can add to project viability;
- risk associated with carbon and its mitigation.

7.3 New Implications of Emission Reductions on the Financing of a Project

The existence of ER value and a purchase contact will have an impact on all of the other project participants in a project. The most obvious of these is that by introducing a new revenue stream it alters the risk profile of the project itself. In normal circumstances this would reduce both the cost of debt and the amount and combination of debt and equity required. In this section we discuss what the impacts might be on specific participants.

These are:

- **Sponsors and Equity Providers:** The main impact on sponsors and equity providers will be to improve the returns from the project as it is likely that the additional revenue will lead to lower debt and equity requirements. The lower debt requirement may lead to a lower cost of debt (due to a perceived lower risk profile) and the lower equity requirement should lead to increased returns to equity holders. Put simply it should make the project more financially viable. This aspect is discussed in more detail in the section below on financial viability.

- **Operators and Suppliers:** As these entities will be part of the risk transfer process there will be a further financial impact on them should the risks that they bear materialise. As there will generally be a close correlation between the performance of the project and the volume of reductions achieved, non-performance or achievement by one of the parties will have a further consequence on the volume of emission reductions achieved. Thus the most likely impact on Operators and Suppliers will be to increase the amount of risk that they will be asked to bear. It is possible for these risks to be transferred elsewhere, but to do so would be inconsistent with the principle of allocating risks to the parties most able to understand and manage them.

- **Purchaser:** In the context of the ERs this will be the purchaser of the emission reduction output from the project. The purchaser will assess the project using similar criteria to other providers of finance. This is because in general there will be a high degree of correlation between the performance of the project and the volume of emission reductions achieved. The Purchaser will want to deal with project developers who have a track record in delivering

projects on time, and operating similar plants, to ensure that the ERs are delivered. The purchaser is also likely to want to vet the contractual arrangements of the conventional outputs (electricity or energy savings), ensure that the main project participants have a track record in the conventional aspects of the project, and that proper risk management arrangements are in place. The ER purchase agreement could be:

- A contract for an agreed amount of emission reductions in the future;
- Purchase of an as yet unknown (but expected) volume of reductions;
- Paid up front;
- Paid on delivery of verified emission reductions.

Lenders will only take into account ER value in the assessment of the project if a carbon purchase agreement (CPA) is in place i.e. if the value is clear and it exists.

Currently, the buyers of ERs can be divided into two categories: national governments and private sector firms. There are and will be governments who foresee difficulties in meeting their Kyoto Protocol targets who will seek to meet their targets by purchasing emission reductions as part of their overall climate change strategy. The Dutch Government is adopting this approach and is already active in the market through their JI emission reduction tendering programme – ERUPT[7].

There are and will be private sector firms that will purchase emission reductions because they face or anticipate constraints on their emissions from domestic regulatory controls. This regulatory model is likely to be adopted by a number of European Union, North America, and Japan. In the UK a domestic emissions trading scheme will be implemented from April 2001. In North America, where there is familiarity in trading emission reduction associated with nitrous oxide and sulphur dioxide, firms are already purchasing GHG emission reduction in anticipation of forthcoming regulatory controls.

The World Bank has also developed a purchasing programme for both Government and private company clients called the Prototype Carbon Fund (PCF), which is actively involved in buying ERs from projects that are likely to be eligible under the JI and CDM mechanisms.

- **Multilateral Agencies:** The multilateral agencies are interested in co-financing ER projects. The agencies are also able to provide risk mitigation products to provide projects with protection against certain types of risk. These institutions are and will play a significant role in the development of JI projects as their work is driven by the policy objectives of their investors who are mainly derived from the Annex 1 parties to the Kyoto Protocol.

  The World Bank is active in the market through the PCF. The multilateral agencies are likely to play a leading role while the market is still developing. Even after it has matured they are likely to play a role in providing financing solutions in sectors or countries where the private sector is unwilling to do so because of the risks involved. The EBRD is actively involved in the development of low emission technologies, energy service companies and is currently looking to provide services in the JI field.

- **Export Credit Agencies (ECAs):** As well as providing insurance to exporters against political, and commercial risks, currency movements, interest rate support, and lending money directly to assist exports, some ECAs are examining whether they can assist JI projects. In particular they are looking to provide insurance assistance in relation to the emission reduction components of projects.

[7] The Dutch Government JI emission reduction tendering programme was launched in 2000.

- **Insurers:** In the JI context where the emission reductions are to be incorporated within the project finance structure, it is likely that the lenders will require insurance that the emission reductions can be delivered. A number of companies, are beginning to develop such carbon risk mitigation products.

- **Lenders.** The lenders in their assessment of the project, will analyse the quality of the financial flow from ER value. Thus in order to contribute to the improvement of the perceived financial viability of a project the purchaser will need to be a creditworthy entity capable of delivering its financial obligations. In addition, it is possible that the existence of ERs may result in a revised financing structure. It may well be that the ER component is put into a separate (possibly a securitised) vehicle or that it is used as part of a subordinated loan structure to optimise the returns to equity holders. At present, in the absence of a good quality CPA, ER value is seen as an uncertain cash flow. A number of current ideas revolve around using the rights to emission reductions as part of a "kicker" to providers of subordinated debt. This in turn may reduce the need for equity. Lenders will also need to consider:

    1. How to take a charge over this revenue stream;

    2. The legal implications of ownership of ERs (which will depend in different legal systems on how this asset is characterised);

    3. Carbon accounting procedures;

    4. Action in the event of non-payment by a purchaser;

    5. Ranking in terms of use of the proceeds;

    6. Intercreditor issues with other participants in the event of non-payment/performance.

- **Experts:** In relation to both the ER and technology components of JI projects, the lender is likely to seek the advice of experts on the technical (eligibility and quantification of ERs), environmental and risk aspects of the ERs generated by projects. The investors and lenders in particular will want to ensure that the technology is commercially viable and can perform according to the specification in the business plan. This has been a problem for many of the clean technologies that are likely to be crucial to the development of emissions reductions. If a technology is unproven and, in the experts opinion, there is a high risk of under-performance, this has a knock on effect on revenue streams from both the ERs and the electricity/energy savings.

- **Host Government:** The host government will have a central role in JI projects in terms of providing consents for the project to proceed as a JI project. This will be clarified in due course, at the COP meetings. In addition the government is likely to have a control over the type of JI projects implemented, and may also want a share of the ERs generated by projects in its territory.

- **International Government**: As was discussed in Section 4, a host Government may have total control over project eligibility, or it may have joint control with the UNFCCCs Executive Board. Joint control with the Executive Board, will create an additional hurdle for project approval.

7.4 Financial Viability and Emission Reductions (ERs)

In order for lenders to take account of ER value in their analyses of projects, there are a number of pre-requisites. There must be either a real market in ERs (as is the case with other commodities), or a CPA in place. As the former does not yet exist, for the time being the market will require that a CPA be in place. In order for there to be a purchaser, there needs to be clear evidence that:

- The project will be eligible;
- The baseline against which the reductions will be assessed will be approved;
- The project can demonstrate clear title over the reductions to the purchaser.

The natural consequence of securing ER value will be that investors and lenders will need to invest less equity and debt finance. Equity investors will thus obtain a greater return on their investment.

In order to see whether the ER value can aid the viability of a project, the developers will have to quantify the financial revenues that ERs can generate, which is determined by:

- the quantity of ERs produced;
- the price that can be achieved for ERs;
- the transaction costs involved in securing ER value;
- risk associated with the project, and its ability to generate ERs.

The first step is to determine if ER value exists, and if so, if it can be secured by the project, and sold to the purchaser. This depends on whether the project meets the emerging JI eligibility criteria, and whether the title to the ERs can be secured. Whilst JI eligibility rules have yet to be finalised, it is possible to ascertain the likely criteria that will have to be met to secure the ER revenue by analysing the international policy texts discussed in Section 2. An expert opinion that compares the project characteristics against these criteria will provide an initial view as to the eligibility. It may be necessary to ascertain eligibility against international and host Government criteria as well as specific ER purchase criteria such as in ERUPT and PCF. Both these purchasing programmes have their own requirements in addition to those that they anticipate being imposed by international regulation.

Of vital concern to all parties will be whether title to ERs can be determined, thus allowing project parties to enter into a carbon purchase agreement. The legal frameworks in the country for which the project is located (which are still under development) will regulate the proprietary rights over emission reductions.

As mentioned in the introduction, ERs in the context of JI are equivalent to Assigned Amounts and JI projects will ultimately result in transfers of Assigned Amounts. There is still uncertainty over who can own emission reductions. The wording of the Kyoto Protocol can be interpreted to mean that ERs can only be held and transferred between Government entities.

If this interpretation is correct then a memorandum of understanding (MOU) must be arranged between host and investing/purchasing governments as the basis for the contractual vehicle for transfers of assigned amounts.

The situation for a company or other multi-lateral organisation wishing to purchase ERUs through an emission reduction project is not favourable. This situation reflects the fact that international policy does not explicitly permit such agreements. While a number of non-nation state government entities have sought such agreements, the host governments in the CEE countries have been

reluctant to engage in them. However one such organisation (the World Bank, through the PCF) has entered into an agreement with Latvia but has not been able to do so in Poland. Poland appears to have adopted the position that transfers can only occur between Governments.

For the market to develop its full potential, either the property rights over ERs must be allowed for private sector entities or a mechanism be found such that an exchange of equivalent value can be made between investor governments and the private sector entities undertaking JI projects

A concern remains over the permanence of the ERs once validated. There must be certainty that once ERs are generated (i.e. validated by the host Government and/or by operational entities against the international criteria) and contractually allocated, that this is binding. If the possibility exists that ERs, once validated and verified, can be retrospectively disallowed, this will have an impact on the price that be achieved for the ERs and damage the development of the market.

7.4.1 Price

The price that ERs ($/tCO$_2$) can currently achieve has been observed by EcoSecurities at between $US 1.00 and $6.00. As the likely obtainable price is so uncertain, potential lenders and investors in projects are unlikely to be convinced by unsubstantiated forecasts in project or business plans they review. Since the market is immature they are also likely want some form of purchase agreement to be in place. The two ER purchasing programmes, ERUPT and the PCF are entering into such agreements, both of which are likely to be of such credit standing to provide confidence to lenders and investors. Pre-COP6 these purchasing programmes are offering in the region of between US$3.00 to $6.00 per tCO$_2$ reduced.

To date the number of CEE and ER purchaser nations entering into such agreements have been limited. A number of countries have entered into such agreements including the Netherlands and Norway on the investor side, and Latvia, Poland and Romania on the host side.

For both the buyers of ERs and project lenders, it is likely that some form of ER validation will be required to convince them that the ERs generation is achievable. A buyer is unlikely to enter into a CPA agreement without some form of validation. Formal validation may not be necessary, as buyers and lenders may be able to obtain sufficient assurance from expert opinion on any ER feasibility study undertaken by the developers.

7.4.2 Volume and Time-scale

The quantity of ERs generated can be determined through an emission reduction feasibility analysis, and can be confirmed through a pre-validation assessment by experts on behalf of a potential investor, purchaser or lender and subsequently through the formal validation by the regulatory agents.

Under the emerging JI policy framework, ERs can be generated during the 2008-2012 commitment period, which provides 5 years of potential revenue for a project. JI is likely to be adversely affected when compared to the CDM, as it is restricted to the commitment period. For projects where the ER value is critical to viability the most a project could receive up-front would be the present value of the reductions achieved, during the commitment period. This has stimulated demand for early crediting under JI. To compensate for this problem the PCF is, for example, asking host nations to apportion AAs from the 2008-2012 commitment period to pre-2008 project emission reductions achieved by JI projects. This will allow projects to be more easily implemented pre-2008, as the revenue can be incorporated into the project cash flows earlier.

Some purchasers may consider bidding for post 2012 ERs, taking on the risk that credits may not exist under post 2012 regulatory arrangements. The present value of post 2012 ERs is negligible,

because of general discounting principles and policy uncertainty (buyers risk) surrounding post 2012 circumstances.

Apart from using the ER value from a CPA, with payment on delivery terms, there is the possibility of selling the potential ERs up-front to assist in the initial capital financing of the project. For example the PCF, in a standard CPA, will negotiate a risk-adjusted price on delivery of the ER after verification. However, the PCF is willing to consider where a project requires initial capital raising, to provide the finance up-front. However, because of the greater risks involved, the price for such ERs will be discounted.

7.4.3 Transaction Costs

In this section we examine the costs of transacting a JI project, and the impact on the viability of ER value for both a small and large generation project. ER transaction costs could have a significant impact on whether ERs add to the viability of a project. Undertaking a project under JI framework will only be viable if the costs of transacting the ERs are substantially lower than the revenue they will generate.

Outlined in Table 8 below are example transaction costs for JI electricity generation projects estimated by EcoSecurities, and based on experience in the field. The costs are based on the assumption that JI requirements will be similar to the CDM project cycle outlined in Section 2.3.

Table 8 - Transaction Cost Estimates

JI/Emission Reduction (ER) Project Cycle	EcoSecurities Estimate of Cost (US$)
A) Up-front (pre-operational) Costs:	
1. ER Feasibility Assessment	12,000 - 20,000
2. Monitoring & Verification Plan	5,000 - 20,000
3. Registration	10,000
4. Validation	10,000 -15,000
5. Legal work	20,000 – 25,000
Total Up-front Costs:	57,000 – 90,000
B) Operational Phase Costs:	
1. Sale of ERs:	Success fee in region of 5 -10% of ER value. Higher for a small project than a large project.
2. Risk mitigation	1-3% of ER value yearly. Mitigation against loss of incremental ER value as a consequence of project risk.
3. Monitoring and Verification	$3,000 - 15,000 per year.

However, it should be noted that there are various possibilities for adopting simplified procedures for the pre-operational phase. For example, as proposed at the 13th Subsidiary Body meeting in Lyon, some countries within the JI might be allowed to adopt the simplified JI procedures according to a twin track approach, i.e. in those countries that are in full reporting compliance (see Section 4 for more details) .

Another possibility is that some countries will adopt top-down predefined baselines. When utilising a predefined baseline there is no need for developing a new, "without project" baseline scenario for assessing environmental additionality.

Some proponents of a 'positive list', are arguing that project types on this list should be subject to more simplified procedures and less strict requirements.

The application of these simplified procedures could reduce the scope of the work and thus the costs involved in developing and transacting ERs. However, in EcoSecurities opinion the difference in transaction costs between a more complicated and a simplified JI approach is, in most cases, not likely to be substantial. The reason for this is that projects following a simplified approach are not necessarily exempted from all the phases as presented in Table 8. It is most likely that for both approaches there will remain a need for developing an emission reduction feasibility report, monitoring plan, for registration, validation and verification, risk mitigation, sales fees and for developing legal and purchase contracts. Therefore, the cost associated with the sale of the ERs is likely to be similar, in whichever regulatory regime eventually governs JI.

It has to be noted that the size of a project is an important parameter when considering the total transaction costs. It could be assumed that for smaller projects the total amount of transaction costs could be substantially less. However, EcoSecurities believes that in most cases a similar amount of

work will be required for all the transaction cycle activities regardless of project size and thus transaction costs will be similar in absolute terms for both large and small-scale projects. Accordingly, in percentage terms, transaction costs will be lower for large projects and thus these will be more attractive.

There is more likely to be a difference in costs for different project types – supply side generation and demand side energy efficiency. EcoSecurities experience to date has concentrated on supply side generation projects and this will be the focus of the following transaction cost analysis.

7.4.3.1 Assessment Financial Viability

When considering the financial viability of a project, lenders and investors are particularly interested in assessing the cash flows over the first few years of operation. As already discussed in Section 4, this is the most critical period when attempting to attract finance. Therefore, we examine (see below) the impact of the first 5 years ER transaction costs, in relation to the revenues over that period. The results are shown in Table 9. The analysis concentrates on the pre-operational costs (see Table 8 under A), as the operational transaction costs (see Table 8 under B) will only be of relevance if the project is considered viable based on pre-operational costs. These are discussed later in this section.

As indicated in the table above the total cost estimates for the pre-operational phase are between $57,000 – $90,000.

In order to give an example of how this might effect transaction costs we examine two examples of a typical small and large project and see the impact of the up-front costs. The two examples, which have been created from EcoSecurities experience in the field, are:

- 150MW gas plant, 20 year, resulting in reductions of 350,000 tCO_2/yr;
- 2MW biomass plant, 20-year lifetime, resulting in reductions of 35,000 tCO_2/yr.

We assume that ERs are purchased at $3.00 tCO_2 in present value terms, a conservative price within current price ranges. The impact of varying prices is considered later in this section. Table 9 below presents the resulting ER value for both projects. The values are based on the above project assumptions, over the first 5 years of operation, and discounted to present value at 6 % per annum.

Table 9 Revenue and Up-front Transaction Costs

Small Project						
	Totals (Present Value)	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Emission Reductions (tCO2)	156,279	35000	35000	35000	35000	35000
Value (Price $3 tCO2)	$468,836 (Discounted at 6%)	$105,000	$105,000	$105,000	$105,000	$105,000
Net Revenues	$410,120	$91,850	$91,850	$91,850	$91,850	$91,850
Total Up-front Costs between	$57,000	$90,000				
Net Present Value between	**$373,120**	**$345,12**				
Large Project						
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Emission Reductions (tCO2)	1,562,787	350000	350000	350000	350000	350000
Present Value	$4,688,361	$1,050,000	$1,050,000	$1,050,000	$1,050,000	$1,050,000
Net Revenues	$4,503,059	$1,008,500	$1,008,500	$1,008,500	$1,008,500	$1,008,500
Total Up-front Costs between	$57,000	$90,000				
Net Present Value	**$4,466,059**	**$943,500**				
Transaction Cost Summary:			**Small Project**	**Large Project**		
Up front costs as a % of NPV of emission reductions		**Low Cost**	13%	1.2%		
		High Costs	22%	2%		

Generally project developers would expect transaction costs related to JI (expressed as a percentage of the potential value it creates) to be consistent with the level of other transaction costs in projects. Given the risks inherent in securing ER value, it is clearly not worthwhile undertaking the process if the costs outweigh the benefits. Project developers generally expect up-front costs to be no more than 5-7% of the net present value of the revenue. In our example, the up-front costs for the large project are within this range at 1.2% - 2%, which means that claiming ER value would probably be viable at this stage. However, the figures for the small project, at between 14% and 22%, would not be tenable.

Based on both assumptions (5-7% threshold for up front costs and a price of $ 3 per ton CO2) it is then possible to determine the minimum amount of ERs that have to be generated by the project for it to be viable. In our example the minimum quantity of reductions is in the region of 75,000

tCO2 per annum at a total of up-front transaction costs of $57,000. When costs are higher ($90,000) the amount of ERs would need to be at least 105,000 tCO2.

However, it should be noted that the above analysis does not take into account the operational costs, or other potential costs – like adaptation levy, administration charge etc. (see below), although these are not "at risk" costs as they are only paid if the project goes ahead. These costs will have to be considered before a final decision can be made about the viability of a JI project.

Table 10 below plots a range of up front transaction costs, as a percentage of net revenues from ERs, against a range of prices per ton of CO2.

Table 10 What If Table: Up-front Costs and ER Prices

Small Projects					
	Up-front cost $ at >				
PRICE v	**55,000**	**65,000**	**75,000**	**85,000**	**95,000**
$1.00	51.43%	60.78%	70.13%	79.48%	88.84%
$2.00	21.27%	25.14%	29.01%	32.88%	36.75%
$3.00	13.41%	15.85%	18.29%	20.73%	23.16%
$4.00	9.79%	11.57%	13.35%	15.13%	16.91%
$5.00	7.71%	9.11%	10.51%	11.92%	13.32%
$6.00	6.36%	7.52%	8.67%	9.83%	10.98%
$7.00	5.41%	6.39%	7.38%	8.36%	9.35%
$8.00	4.71%	5.56%	6.42%	7.28%	8.13%
$9.00	4.17%	4.93%	5.68%	6.44%	7.20%
$10.00	3.74%	4.42%	5.10%	5.78%	6.46%
Large Project					
	Up-front cost $ at >				
PRICE v	**55,000**	**65,000**	**75,000**	**85,000**	**95,000**
$1.00	3.74%	4.42%	5.10%	5.78%	6.46%
$2.00	1.84%	2.18%	2.51%	2.85%	3.18%
$3.00	1.22%	1.44%	1.67%	1.89%	2.11%
$4.00	0.91%	1.08%	1.25%	1.41%	1.58%
$5.00	0.73%	0.86%	1.00%	1.13%	1.26%
$6.00	0.61%	0.72%	0.83%	0.94%	1.05%
$7.00	0.52%	0.62%	0.71%	0.80%	0.90%
$8.00	0.46%	0.54%	0.62%	0.70%	0.79%
$9.00	0.40%	0.48%	0.55%	0.63%	0.70%
$10.00	0.36%	0.43%	0.50%	0.56%	0.63%

The table shows that for the large project securing the emission reduction value would be worthwhile, even in a scenario where the costs are high and at a low price of $1.00 tCO2. However, for the small project it only becomes viable to securing the emission reduction value at a price of $6 t CO2, and then only when the up front costs of transaction remain low.

In EcoSecurities' experience, developers would not consider a project worthwhile if the total (i.e. up front as well as operational) transaction costs did not exceed 10-12% of the net present value of revenue.

Based on our example above, where we analysed the up-front costs assuming a price of $3 tCO2, it is only relevant to assess the operational phase costs for the large project. The operational (see Table 8 under B) costs are:

1. Monitoring and verification costs between $3,000 to $15,000 or between 0.3% and 1.1% of the net present value (NPV) of revenue of the project;
2. Risk mitigation fees are between 1-3% of the NPV of revenue of the project;
3. Sales success fee[8] of about 5% of the NPV of revenue of the project.

This brings the total operational costs between 6.3% and 9.1%. If we add these to the up-front cost (1.2% - 2%) we end up with the total transaction between 7.5% and 11.1%. This is still lower than the total transaction threshold of 10%-12%, which would make the large project viable. We have not included these amounts in the analysis above, as they are not "at risk" in that they are only paid if the project goes ahead and are not lost if it does not proceed.

7.5 Types of Risk

The particular risks associated with emission reductions are summarised in the Table 10 below

Table 11 Typology of Specific Risks for JI Projects

Policy Risks	Market Risks
Uncertainties in the Kyoto process and its implementation for the international and national context	Immature market status, price risks and range of transaction structures for carbon assets

7.5.1 Policy Risks

The evolution and outcomes of climate change policy is still subject to much uncertainty, related to both the international agenda, such as the Kyoto Protocol and to individual countries' domestic implementation of the Protocol, and climate change-related policies.

a) International Policy Risks

- **Ratification of the Protocol**

The Kyoto Protocol is not a legally-binding instrument until it has not been ratified under the terms of Article 25, which sets out detailed provisions governing the treaty's entry into force. With or without ratification of the Protocol, ER value can be reflected through domestic regimes in purchaser countries that accept the ER value of a particular project or project type. Without Kyoto, such value would be much more uncertain and strictly within a subordinate, national greenhouse gas regulatory context. Whilst this is not impossible -- or without merit -- lacking an

[8] Success fees are generally in the region of 5-10% of the revenue secured on the sale of a new commodity. However, as the market matures and becomes more certain, these rates are likely to come down to figures more in the region of 1-3%. For this paper we use rates of between 5% and10%. For larger projects this will be closer to 5% and for smaller projects this will be closer to 10%. This is justified for the reason that as much work goes into a small project as on a large one, and the returns are much smaller in absolute terms for a small project.

operative Kyoto Protocol substantially increases the risks that particular project investments may prove relatively worthless.

- **Eligible energy activities under JI**

It remains unclear which types of energy activities will be eligible for emissions crediting under JI. It does seem likely that both demand side energy efficiency and renewables will be eligible, but whether any fossil fuel based generation activities that lead to emission reductions will be included is uncertain. This is complicated by the uncertainties surrounding the operationalisation of JI. JI projects may have to follow a the CDM project cycle or there may be some form of twin track approach to JI may be adopted. For countries in full compliance with the KP host country may be all that is required. For those parties out of compliance the CDM project cycle will have to be adopted.

- **Investor country policies**

Investor country internal regulations for allowable credit transactions from JI could mirror the Protocol exactly, be more expansive than the Protocol or be more restrictive than the Protocol, in terms of particular technologies or points of origin. For example, certain countries have expressed reservation about the utilisation of emission credits from nuclear power (if such are allowed) and it is easy to imagine that nations might wish to restrict imports from countries for qualitative reasons.

- **JI requirements**

As noted above, there is great deal of uncertainty related to how JI will be operationalised. These include whether the adaptation levy[9] is applied. There is also the issue of whether JI projects must be vetted by the international process, via the Executive Board, as well as be certified by independent third parties along the lines of a financial or technical audit, or left to host nations likely to be in compliance.

Another issue is whether financing of JI projects cannot supplant overseas development aid funds from unilateral, bilateral, or multilateral sources. There is also the question of whether JI – by definition – requires the participation of a bilateral purchaser party. This is extremely controversial, as without this definition, countries would be able to institute emission reduction projects unilaterally.

These issues both increase costs and may be interpreted as increasing the risk that a project will be found to be under-performing or ineligible according to JI guidelines.

- **Restrictions on Credit Use**

The capping of the amount of emission reductions that Annex 1 countries can recognise through the flexible mechanisms could impact the value of particular JI investments. Developing countries and the European Union have been advocating restrictions on the import of allowances and credits from JI and CDM, with several competing formulae under consideration.

It is likely that restrictions on JI/CDM investment caused by supplementarity requirements would result in a great reduction in the price of these types of emission reductions. This is because, for a same level of supply, there will be a reduced level of demand.

[9] A fee charged to projects to be used by developing countries who are threatened by climate change to implement appropriate adaptation measures

If the market for external credits is artificially restricted to a particular size, only the lowest cost options (such as so called "hot air" from Russia) would enter the market. Simultaneously, industrial countries like Japan and the US pay more for meeting their climate obligations, due to being forced to implement emission reductions that are higher on the marginal cost abatement curve, rather than importing more competitive priced credits. Simply put, it appears that under trading caps, both suppliers and demanders lose – perversely paying more and receiving less, respectively, than they might in an open market.

b) Host Country Policy Risks

There are risks associated with the host country's implementation of the Kyoto Protocol, particularly the conditions under which JI/CDM investments and energy projects will be allowed. Herein, we particularly consider risks from the perspective of interacting with the host country.

- **Implementation of the Protocol**

Assuming ratification, the time-scale over which the Protocol will be implemented through national legislation is unclear. It can also be expected that different countries will implement their Kyoto ratification requirements in different ways, in accordance with their own national objectives and priorities. This could impact the viability of projects that fall outside those considerations

For investors, there may be an important issue of whether non-ratifying countries are allowed to export emission credits. If transactions were conditional upon ratification, participating in projects in non-ratifying countries (with the expectation that ratification is forthcoming) would be riskier than investing in a country that has already ratified Kyoto.

- **Host country approval**

Both JI and CDM projects require host country approval. Many countries are still establishing regulatory agencies that are authorised to grant approval of these activities on behalf of the government. As noted above, JI credits may be less restricted if host countries allocated the emissions cap to sectors and companies and allow the free market to determine where emissions are best mitigated.

- **Credit Sharing**

Credit-sharing arrangements will be subject to host country criteria, which at this point, few countries have in place. Poland has indicated that credits in proportion to any investment sourced from domestic funds, banks and grant facilities will be Government property. Cross border projects are subject to contract negotiations for the credit split, until policies are established that formalise a particular formula. Such a policy may well never emerge, meaning that all credit sharing arrangements would be negotiated as part of each individual project contractual arrangements, and in this will have to be clearly stated in a carbon purchase agreement (CPA).

- **Eligible energy activities**

Energy activities allowed under JI in individual countries could reflect different countries internal agendas and policy directions in the energy sector. There may be wider political considerations, which prevent certain types of projects from being eligible. For example a country may not want to rely on gas generation because it is sourced from a neighbouring country, which is politically or economically unstable.

The GHG emission reduction benefits of all JI & CDM projects are required to be additional to what would have occurred otherwise. This requires the development of a baseline against which project's benefits are quantified. Currently, there is a lack of standardised baseline methodologies and different methods have been used by different projects. That could lead to a baseline that would not be acceptable to third parties as required by certification criteria. Depending on the method used, the expected carbon credit returns to an investor may be undermined.

Leakage is defined as the occurrence of emissions taking place outside the project's system boundaries as a direct or indirect result of the project. If not identified at the project preparation phase, and if mechanisms are not put in place to mitigate its effects, leakage could lead to large reductions in the overall carbon "yield" of a project.

- **Legal aspects**

In most countries, legalities relating to the allocation of carbon property rights, establishment of title, and carbon asset sales have not yet not been addressed. In such cases, the question of who holds the rights to carbon trading units can be quite complex. In general, few countries have addressed this issue within their domestic legislation.

- **Energy Policy & Regulations**

There is the risk that JI activities may directly contravene other components of energy and policy within a host country. CDM projects could also be impacted by new regulations, via either the termination existing regulations that 1) threaten the project's ability to be implemented; or 2) dramatically impact the baseline, leading to more or less emission savings. For example, the termination of tax incentives for energy savings would change the dynamic under which the project operates. Fragmented laws and inconsistencies could lead to greater uncertainty over regulatory consistency.

c) Political and Country Risks

This is a important area where conventional risks associated with cross border investment are evaluated for a country's strengths, weaknesses and areas of potential concern. Included in this analysis are the broad categories of social conditions (labour, literacy, health), economics (growth, revenue generation, balance of payments), government (sources of power, regime stability), and climate for business (investment and trade restrictions, banking and financial sectors). This section deals only with those risks specific to JI energy projects. A relevant source of risk is that of expropriation, where energy generation sector could be nationalised.

7.5.2 Market Risks

Risks associated with the marketing and sale of CO2 credits derived from energy projects under JI.

- **Price uncertainty of emission credits**

Even assuming the existence of a liquid market for emissions credits, there remains the unpredictability of future prices and market development. This directly impacts how much parties will be willing to pay – in NPV terms – for streams of quality credits in the future. The competitiveness of carbon credits sourced through JI investments, as compared to tradable emission allowances and internal abatement options (e.g., process efficiencies, technological improvements, renewed capital stocks) is uncertain and depends on many variables. With estimates of market clearing price ranging from under US$1 per tonne of CO2 to over US$100, per tonne of CO2 (based upon different assumptions of economic growth, technological development

and policy driven market restrictions), the ability to predict a future value stream from a particular investment – even if performance risk-adjusted, is quite a challenge.

- **Credit Delivery**

The current market remains illiquid, with carbon credit transactions tending to be bilateral or multilateral between identified buyers. Liabilities associated with credit quality are likely to be assumed by the buyer as it is for other existing tradable commodities like grain, minerals, etc. The credibility and reliability of the seller will largely determine the credit quality, and thus the price.

- **Transaction structure**

The transaction structure must adequately cover issues such as the title to the carbon is secure. This could be granted contractually through a carbon purchase agreement (CPA), which should provide guarantees that revenue from the ERs can be realised.

7.6 Risk Management

As discussed in relation to conventional financing, in Section 6, risks can be dealt through allocation to a party in the project structure, or it can be transferred out to third parties through risk mitigation products. This also applies to the ER asset, which can be guaranteed and insured against non-performance or under-performance.

In the private insurance sector, companies are now providing carbon credit risk transfer services (see Section 6). The government credit guarantee agencies, such as the UK's Credit Guarantee Agency, are beginning to consider their role in the carbon market.

Another insurance option active in the market is the option to provide replacement credits from pools that they control. Niagara Mohawk, a New York based electric utility that holds substantial volumes of emissions credits, had offered to insure performance of AIJ projects.

8 FINANCING SOURCES - INSTITUTIONS AND INSTRUMENTS

8.1 Introduction

This section contains an inventory of financial institutions and instruments that are applicable to financing power sector and JI projects. Information on financial measures was obtained from an internet search followed by interviews based on a questionnaire (see Appendix 1) on financial measures in which they were asked to characterise the available financial measures in their country. The members of JOINT project gathered information on funds available on the European and global level. The collected information was recorded in a database. The database was used to analyse general trends in financing possibilities. This Section reports the results of this analysis together with general observations obtained from contacts with the different funds and programmes. Detailed information per financial measure can be found in Appendix 2.

All of the 5 countries participating in the Joint Project returned the questionnaire and 32 potential financing institutions and programmes were identified. Due to resource constraints only an indicative number of commercial sources were approached. Of the sources identified these can be categorised into the following types of instruments grants, loans, equity, risks mitigating options.

8.2 Grants

Table 11 lists the grant programmes reviewed by the country teams and presents the restrictions per programme regarding the location of applicants and projects.

In total 11 grant programmes have been reviewed of which:

- 6 are in CEE countries. All these programmes are restricted to projects specifically implemented in the host CEE country and applicants in the investor country.
- 1 is initiated in UK. In general the programme supports projects in all CEE countries.
- 4 are initiated on a multilateral level (EU and UN). These programmes generally have fewer restrictions regarding the grant recipient's country of origin or the location of projects, when compared to the national programmes.

If there are project participants, other than those from UK or host countries, such as equipment suppliers, who are from other countries there could well be grants available for the project and this should be explored.

Table 12 Overview of reviewed grant programmes and the restrictions with regard to the origin of the applicant and the location of projects

DESCRIPTION INSTRUMENT	**What are the restrictions for applications?**	**Applicable for projects in Poland, Estonia, Hungary, Slovenia or Czech Republic?**
Instrument for Structural Policies for Pre-Accession (ISPA) [European Union]	None	Yes
Climate Change Challenge Fund (CCCF) [United Kingdom]	Must be settled in the Commonwealth	Yes
Overseas Project Fund	Must be UK exporting firm	Yes
Estonian Innovation Fond [Estonia]	Must be non-profit organisation settled in Estonia	Restricted to Estonia

DESCRIPTION INSTRUMENT	**What are the restrictions for applications?**	**Applicable for projects in Poland, Estonia, Hungary, Slovenia or Czech Republic?**
Energy Sector Management Assistance Programme (ESMAP) - World Bank Group	Must be settled in countries approved by the World Bank.	Yes
Estonian Business Advisory Program (BAS) [Estonia]	SMEs with majority private ownership settled in Estonia	Restricted to Estonia
Energy Conservation Foundation Program [Estonia]	Profit and non-profit firms settled in Estonia	Restricted to Estonia
Poland and Hungary: Action for the Restructuring of the Economy (PHARE) [European Union]	Must be settled in EU or recipient state	Yes
TACIS [European Union]	Applicant must be settled in a EU member state	No
The Government Program for the Support of the energy and fuels savings and utilisation of renewable sources of energy [Czech Republic]	Must be profit or non-profit organisations settled in the Czech Republic	Restricted to Czech Republic
EkoFundusz (The EcoFund - debt to environment swap) [Poland]		Poland
Global Environmental Facility (GEF) [United Nations]	Must be settled in a country approved by the Word Bank	Yes
National Energy Saving Program: Program for Financing Energy Efficiency in Municipalities [Hungary]	Must be a Hungarian Municipality	Restricted to Hungary

Grants are generally available for all activities in the project cycle from pre-feasibility to investments, although most programmes do not cover the whole project cycle. Generally the part of the project costs which can be covered with a grant decreases as activities are more directed towards investments.

All reviewed programmes grant financial contribution to activities in the field of renewables, energy efficiency and energy supply. However some programmes focus on specific topic (see for more details Appendix 2).

The reviewed grant programmes are not specifically aimed at JI-projects (with the exception of the pilot phase AIJ programmes). The objectives of national programmes of EU countries as well as programmes at the EU level is to support the CEE country to comply with EU standards.

8.3 Equity

Table 12, below, lists the reviewed equity financing funds. It must be stressed that this list is certainly not complete as the commercial sector is only indicatively represented. It is likely that there are more funds available in the commercial sector (banks, insurance companies), but we were unable to track down more information on the commercial sector within the resources available for this paper.

A number of financial institutions are beginning to set up equity funds to target emission reduction projects under the international flexibility instruments, including JI. Some examples of these that

are D&B's Clean Energy Fund and EIFs Central and the Eastern European Power fund. These funds are in their preliminary operational phases and have not been active in the context of JI to date. This is mainly because of the international policy uncertainty surrounding JI, which has made any investments heavily based on the carbon component a risky enterprise.

Table 13 Overview of Reviewed Equity Funds

Description instrument	Kind of projects	Location of projects
Energy Investment Fund (EIF) - Central and Eastern Europe Power Fund (CEEP)	1. Heat and power generation 2. Distribution sectors. 3. No transmission or fuels supply projects unless they are part of a generation scheme.	CEE countries
EBRD/Dexia-FondElec - Energy Efficiency and Emissions Reduction Fund	Reduction of energy consumption and emissions across a range of sectors including district heating, public lighting and industry	CEE countries
Clean Energy Fund – D&B Capital [United Kingdom]	1. Restructuring of existing power generation facilities 2. New power generation projects using clean and renewable energy.	All countries eligible
Environmental Investment Partners (EIP) [EBRD]	Small and medium-sized power generation and distribution projects	Mainly Poland, Hungary, Slovak and Czech Republic, Romania

The reviewed equity funds all finance activities in the energy field and in most cases cover all CEE countries. Equity funds focus on investments that eventually lead to the installation of a project that yields revenues. Main features of the reviewed funds are that:

- Investors (preferably) only take a minority share in the project.
- The real return of investment (ROI) must be at least 15%, but most funds require higher returns on investments.

Of the funds listed 3 out of 7, the Environmental Investment Partners (EIP), the Energy Investment Fund (EIF), and the Central and Eastern Europe Power Fund (CEEP)) are still in the marketing phase, including the raising of capital.

Other recently started funds (IFC and Energy Efficiency and Emissions Reduction Fund) were very successful in raising capital. The Renewable Energy and Energy Efficiency Fund (REEF), initiated by the International Finance Corporation (IFC), the private sector arm of the World Bank, raised $65 million in private equity by its first closing. This was some 30% above target.

It can be expected that other funds will start in the commercial sector in the near future.

8.4 Lending Programmes

Table 13, below lists the reviewed lending programmes. A distinction can be made between loans, which operate under market conditions, and soft loans or concessionary finance, which offer lower rates of interest and other preferential conditions such as:

- Longer pay back periods,
- Deferring repayment for a number of years,
- Subordinated loans.

As for the equity funds in the overview of the loans the commercial sector is hardly represented.

Table 14 List of Reviewed Loan Facilities

Description instrument	Type of loan	Main characteristics
International Finance Corporation (IFC) [World Bank]	Market conditions	The project must be in the private sector; Long-term loans (8-12 years) are provided to a maximum of 25% of the project costs.
European Investment Bank (EIB)	Soft loans	Loans are granted for projects in CEE countries Satisfactory rate of return (level varies from project to project) Loans in excess of EUR 25 mill can cover up to 50% of investments and the pay back period is between 12-20 year depending on type of project and size of the business
International Bank for Reconstruction & Development (IBRD) Lending Instruments Facility	Soft loans	Loans are provided to organisations settled in middle-income countries and creditworthy poorer countries. Most IBRD loans are for specific investment projects or programs, including energy.
European Bank for Reconstruction and Development (EBRD)	Soft loans	IRR 20%, but if there is a significant transition effect 10-15%. Government or private guarantee required. Up to 30-40% of project costs are financed
Webb Partnership [United Kingdom]	Market conditions	Corporate and project financing of environmental solutions including emission reduction projects. Specialise in the smaller sized projects.
National Energy Saving Program: Energy Saving Credit Fund [Hungary]	Soft loans	Projects must be located in Hungary Applicant for loan must be settled in Hungary Minimum contribution applicant 25% of project costs.
The Government Program for the Support of the energy and fuels savings and utilisation of renewable sources of energy [Czech Republic]	Soft loans	Applicant has to be based in the Czech republic Project has to be located in the Czech Republic Loan can fund up to 40% of the project costs. Interest rate is 2% for municipalities and 5% for other clients (comparable market rates 6%-14%)
Estonian Innovation Fond [Estonia]	Soft loans	Projects must be innovative. In case of equity financing the fund shall be no smaller than 1/3 of the shares but no more than 49 % of total share capital.

Description instrument	Type of loan	Main characteristics
		Minimum contribution project costs applicant: min. 25%
Private banks that provide debt/loans to projects Hansapank / Estonia Ühispank / Estonia Optiva Pank / Estonia Merita Pank / Estonia	Market conditions	Applicant must be registered in Estonia SPOT should not exceed 8 years Loan servicing ratio app. 1,4 (money earned during the period/interest + loan payment per period) Applicant has to contribute min.>20% average app. 34% of project costs Insurance is required.
The loan program for environmental investments [Slovenia]	Soft loans	Applicant must be settled in Slovenia Project must be located in Slovenia 3.Loan covers up to 80% of project costs

8.5 Risk Mitigation

Table 14 lists the reviewed organisations providing or brokering risk mitigation products cover the conventional risks associated with executing projects in CEE countries. Of these 2, Aon Global Risks Consultants and Swiss RE, are actively involved in trying to provide risk mitigation provides to potential JI projects, and a third, the UK's ECA, is beginning to address its role in the emerging emission reduction market.

Table 15 Overview of Reviewed Risk Mitigation Facilities

Description instrument	Risk Mitigation	Conditions
European Investment Fund (EIF) (part of European Investment Bank)	Guarantees on debt finance to infrastructure projects including energy sector	Financing risk must be shared with banking sector.
Export Credits Guarantee Agency	Will cover commercial & political risks for power projects	Applicant must be a UK based firm
Aon Global Risk Consultants Ltd [United Kingdom]	Provides risk products (risk transfer) for all projects finance components, and are developing carbon trading risk products. Very important for forward sales of credits	Commercial terms
Swiss Re - New market Risk Mitigation	Risk mitigation for conventional and carbon aspects of projects	Commercial terms
International Bank for Reconstruction & Development (IBRD) Hedging (risk) Products - [World Bank]	Guarantees against i) interest rate conversions or swaps; ii) interest rate caps and collars; iii) currency conversions or swaps; and iv) commodity swaps (offered on a case-by-case basis	Project must be located in middle income countries or creditworthy poorer countries

9 REFERENCES

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10 APPENDIX 1 QUESTIONNAIRE FOR FINANCE SOURCES

A. General characteristics

1. Name:
[Fill out the name of the financial measure & associated body i.e. name of bank, government department.

2. Type of financial support
(more than one type may be marked)
1. Loans
2. Equity
3. Grants
4. Risk mitigation products

3. Status
[Is the financial programme still active?]
Yes. As from year:
No. Active in period: until

4. Management
[Who manages the financial measure. In other words to whom should you request for support?]

5a . Procedure
[How can an applicant apply for a contribution? Give a short general description]

5b What is the length of the application process (1 month or 1 year i.e. EU); and what is the time it takes to deliver funds, grants, debt, assistance etc, after the application is accepted?]

6. Kind of projects
a) [What kind of projects can be financed? (more than one category may be marked)]
Renewable energy use
Energy-efficiency measures in industry
Energy-efficiency measures in building
Combined Heat and Power
Efficiency improvements at power plants
Other (specify)

b) Are there any other criteria on top of project type such as minimum/maximum size in terms of key project characteristics e.g. MW for electricity generation project.

7. Location of projects
[In which countries in Eastern Europe can a project can be executed?]

8. Execution of projects
[Which parties can apply for financial support]
Private profit organisations
Non-profit organisations
Public organisations
Consumers

B. Financial characteristics

9. Project costs
[The minimum and maximum project cost that a particular measure is willing to consider?]
Minimum costs/Maximum costs

10. Budget
[What is or was the available budget per year?]

C. Requirements

12. Business economics
[What are the criteria concerning business/project feasibility?

13. Contribution project costs
[Are there minimal requirements regarding the contribution to project costs by the applicant?
No
Yes: how much

14. Technology risk
[Are there requirements regarding the stage of development of the applied technology?]
No
Yes: such as

15. Completion and operating risks
[Are there requirements to cover risks such as time delay in completion of the project or unforeseen operational costs, which affect the cash flow?)

16. Documentation
[What documentation is required in order to get a financial contribution from the fund? E.g. Memorandum of Understanding (MoU), Letter of Intent (LoI), Green Certificate, business plans, feasibility studies, application forms, PPAs etc]

17. Are they including ER value in project finance?
Yes (what are the criteria for accepting this component, is any insurance needed for the ability to transact the value?)
No

D. Experiences

17. What kind and number of projects were financed?
[Give an indication of the number of projects in each category or give the total number of projects].
Type of project Number
Renewable energy use
Energy-efficiency measures in industry
Energy-efficiency measures in building
Combined Heat and Power
Efficiency improvements at power plants
Other (specify)

18. a) Where were the projects executed?

b) Were any of the projects AIJ registered?

19. Which parties applied for financial support?
Private profit organisations
Non-profit organisations
Public organisations

20. Contribution
[What was the average financial contribution per project (as a % of the total project costs) and what was the total financial contribution?]

21. Project costs
(Minimum costs/Maximum costs)

11 APPENDIX 2 FINANCING SOURCES

11.1 Equity Funds

1. Energy Investment Fund (EIF) - Central and Eastern and Europe Power Fund (CEEP) – based in United kingdom

Applicants	Any project developer (governmental or private)
Location of projects	CEE countries
Criteria for support	1) Generally in a more risky country an IRR of between 20-25% is sought, and for a less risky country an IRR of 15-20% is sought. Can consider IRRs of less than 15% in exceptional circumstances. Fund has its own IRR, which allows greater risks to taken on a proportion of projects. 2) Fund does not necessarily require an exit strategy. 2) Project types considered include heat and power generation, and distribution sectors. No transmission or fuel supply projects unless they are part of a generation scheme. 3) Will fund a maximum of 70% of total costs
Contact address	Tel: ~44 20 7766 7160
Application procedure	Varies
Length application	Varies
Required documentation	Varies
Available Budget	The fund currently raised $125 million with a plan to raise a total of $250 when fund is closed to investors in December 2000.
More information	Contact directly.
Remarks	As of August 2000, the fund was in the marketing phase.

2. EBRD/Dexia-FondElec - Energy Efficiency and Energy Reduction Fund

Applicants	Commercial enterprises
Location of projects	Central and Eastern Europe
Criteria for support	1) Projects must have attractive returns, short payback periods and pre-defined exit strategies. 2) Western companies must be active in the area.
Kind of projects	Reduction of energy consumption and reduction of emissions across a range of sectors including district heating, public lighting and industry.
Contact address	European Bank for Reconstruction and Development (EBRD), One Exchange Square, London, EC2A 2JN.
Application procedure	No formal application form
Length application	Varies
Required documentation	Varies
Available Budget	50 million Euro
More information	www.ebrd.com
Remarks	1) This is a new fund launched 1999/2000 2) The fund offers investors the opportunity to earn

emission/carbon credits

3. Clean Energy Fund - United kingdom

Applicants	Any project developer (governmental or private)
Location of projects	All countries eligible
Criteria for support	Projects must yield 18% ROE and above.
Kind of projects	1) Restructuring of existing power generation facilities, with the idea of making them more environmentally friendly. 2) New power generation projects using clean and renewable energy.
Contact: address	D&B Capital, 33 St. James Street, London SW1A 1HDUK
Contact: e mail	howman@cleanenergyfund.org
Application procedure	Contact direct
Length application	Varies
Required documentation	Varies
More information	http://www.cleanenergyfund.org/
Remarks	The fund may also pass on any renewable energy credits it may acquire as a result of its investments.

4. Central and Eastern European Investment Fund Venture capital fund (EIF) – United Kingdom

Applicants	Any project developer (governmental or private).
Location of projects	Mainly Poland, Hungary, Slovak and Czech Republic, Romania
Criteria for support	1) The Fund invests across all stages of development, including start-up, expansion, and buyouts. 2) Projects must improve the environment. 3) Always minority, passive shareholder. 4) High return on equity. The fund will consider small and medium-sized power generation and distribution projects.
Min-max project costs	0.5 - 3.5 million US $
Contact: address	P.O. Box 1469, 7th Floor, Strawinskylaan 3105, 1000 BL Amsterdam, The Netherlands Tel 31 406 4444 Fax 31 406 4555
Application procedure	Contact direct
Length application	Varies
Required documentation	Business plan, financial projections for 5 years, audited financial statement for last three years
Available Budget	22 million Euro (planned: 50 mill)
More information	Contact direct
Remarks	Fund in preliminary phase. The fund operates under the abbreviated name Environmental Investment Partners (EIP) and is managed by the joint venture firm Environmental Assets Management. Among shareholders are EBRD, CDC Participation's, VMH, Swiss government.

11.2 Grants

1. Instrument for Structural Policies for Pre-Accession (ISPA) – EU

Applicants	Firms in EU countries
Location of projects	Albania, Bosnia and Herzegovina, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia
Criteria for support	Facility provides investments, preparatory studies and technical assistance with close links to supported investment project. 1) Project must contribute to bringing environmental levels in the accession country at EU-standards. 2) Projects should have a national contribution. In this context, loan repayments can be considered a national contribution. 3) Projects must fit into a national strategy of each candidate country 4) Only projects identified by the candidate countries in co-operation with the Commission can be supported
Kind of projects	Projects considered include the following categories: drinking water supply, treatment of wastewater, and solid waste management and air pollution.
Contact: address	Directorate General for Regional Policy, Rue de la Loi 200 B-1049 Brussels, Belgium. Directorate F: ISPA and pre-accession measures Marc Franco, Director Tel: (+32) 2-299 1430 Fax: (+32) 2-296 1096 Unit F1: Estonia, Latvia, Lithuania, Poland and Czech Republic Friedemann Allgayer, Head of Unit Tel.: (+32) 2-299 4389 Fax: (+32) 2-296 1096 Unit F2: Bulgaria, Hungary, Romania, Slovenia, Slovakia Jean-Marie Seyler, Head of Unit Tel.: (+32) 2-299 3425 Fax: (+32) 2-295 1174 Additionally every recipient country has got its own EC-delegate
Contact: e-mail	Marc.Franco@cec.eu.int Friedemann.Allgayer@cec.eu.int Jean-Marie.Seyler@cec.eu.int
Application procedure	Tender
Available Budget	1.04 billion Euro for the period 2000-2006

More information	http://www.informationregio.cec.eu.int/w

2. Climate Change Challenge Fund (CCCF) – United kingdom

Applicants	From UK and Commonwealth countries.
Location of projects	Eastern Europe and developing Countries
Criteria for support	CDM related seminars and projects
Kind of projects	Clean Energy and Renewable Energy.
Financed activities	Capacity building and feasibility studies
Contact: address	Foreign and Commonwealth Office (FCO), Whitehall, London SW1A 2AHUK
Contact: e-mail	Farida.Shaikh@mail.fco.gov.uk
Application procedure	Contact directly
Length application	Varies
More information	http://files.fco.gov.uk/esed/cccf.

3. Overseas Project Fund – United Kingdom

Applicants	UK exporting firms
Criteria for support	Project must have a return of £50 million to UK. Sponsor has to pay 50% of costs. Fund will cover up to 50% of pre-contract cost
Financed activities	Export activities
Min-max project costs	Project must have a return of £50 million to UK
Contact: address	British Trade International (BTI), Kingsgate House, 66-74 Victoria Street, London, SW1E 6SW, UK.
Application procedure	Contact BTI direct
Length application	Varies
Required documentation	Varies
More information	Contact BTI directly

4. Estonian Innovation Fond – Estonia

Applicants	Non-profit organisations settled in Estonia
Location of projects	Estonia
Criteria for support	1) Projects must be innovative. 2) In the case of equity financing the funding shall be no smaller than 1/3 of the shares of the project, and no more than 49 % of total share of capital. 3) Minimum contribution project costs applicant 50 % (maximum contribution 250,000 EURO)
Kind of projects	All kind of subjects
Contact: address	Eesti Innovatsioonifond
Length application	1 month - the money comes mostly via state budget.
Required documentation	Business plans and feasibility studies.
Available Budget	2.2-2.5 million EURO
Experiences	At the end of 2000 the 4 funds of the Estonian Innovation Fond (i.e.

	Subsidy, Low-interest loan. Third party financing, Guarantee Fund) will be united and shall be established Estonia Entrepreneur Development Foundation and shall give only grants in future
More information	www.if.ee

5. Energy Sector Management Assistance Programme (ESMAP) - World Bank Group

Applicants	Applicants from World Bank approved countries. This includes accession countries
Location of projects	Economies in transition and developing countries
Criteria for support	Facility will fund pilot projects, feasibility studies and technical assistance. 1) The activity supports one or more of ESMAP's three priority areas - a. market-oriented energy sector reform and restructuring, b. access to efficient and affordable energy, c. environmentally sustainable energy production, transportation, distribution and use. 2) The activity is innovative. 3) Developing, testing, and mainstreaming ideas and approaches. 4) The activity contributes to the institutional and human capacity in the recipient country. 5) The activity addresses poverty, social and gender issues. 6) The activity is likely to be better implemented through ESMAP. 7) The activity is likely to generate results to be used in other countries. 8) The activity can lead to additional substantial investment. 9) The activity can result in important new knowledge, for which there is a clear demand. 10) Eligible activities include energy policy, energy use, energy distribution, transportation, and renewable energy.
Contact: address	1818 H Street NW, Washington, USA
Contact: e-mail	esmap@worldbank.org
Available Budget	1n 1997 ESMAP funded projects to a total of US$ 4.3 Million
Experiences	Mainly funded studies, and mostly in developing countries. There has been one CDM project capacity building project in Africa - cost US$1 million, with funds received from ESMAP. One project in Lithuania on heat supply to small cities the project cost US$349,000, with funding from ESMAP amounting to$274,000.
More information	http://www.worldbank.org/html/f

5. Estonian Business Advisory Program (BAS)

Applicants	SMEs with majority private ownership settled in
Location of projects	Estonia
Criteria for support	Maximum 50% of project costs. Activities funded include feasibility studies, pre-feasibility studies, business plans, market studies, quality systems, strategic planning, and information systems.
Min-max project costs	Maximum costs 9000 Euro

Contact: address	BAS program, Harju 6, Tallinn 10130, Estonia Tel: 6310633
Length application	1-2 months
Available Budget	0.5 million Euro
Experiences	Approximately 400 projects supported so far, only a couple are energy related.
More information	Contact directly
Remarks	1) Third party financing is also foreseen as being part of this scheme in the future. 2) The Bas programme is operating under the agreement between Denmark, Finland, Sweden, Norway, Iceland and EBRD for supporting SMEs. 3) Similar programs are active in Latvia and Lithuania

6. Energy Conservation Foundation Program – Estonia

Applicants	Profit and non-profit firms settled in Estonia
Location of projects	Estonia
Criteria for support	1) Approximately 70% of the budget sum should go to the counties and remainder 30 % for financing projects ordered by the state i.e. Energy master Plans etc. 2) Will fund activities related with energy conservation (i.e. replacement of heating sub-stations, insulation, and replacement of windows etc) 3) Facility will fund master plans, feasibility Studies, and co-financing
Financial benefits	Max 50% of project costs
Contact: address	Ministry of Economical Affairs of Estonia, Mr. Heikki Kulbas
Length application	1-2 months
Available Budget	0.5 million Euro in 2000

7. Poland and Hungary: Action for the Restructuring of the Economy (PHARE)- EU:

Applicants	Profit and non-profit organisations in EU Member States and r recipient States of the Phare program
Location of projects	Albania, Bosnia and Herzegovina, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia
Criteria for support	Aim of program is to support countries for accession preparation. Will fund up to 70% of budget for investment activity, and up to 30% for institutional capacity building activity.
Contact: address	Phare and Tacis Information Centre, Rue Montoyer 19, B- 1000 Brussels, Belgium.
Contact: e-mail	phare-information@cec.eu.int
Application procedure	Tender
Length application	6 months
Available Budget	6.693 billion Euro for the 1995-1999 period (every

	year distribution among the recipient countries varies)
More information	http://europa.eu.int/comm/enlarg

8. TACIS –EU

Applicants	Profit and non-profit organisations in EU Member States
Location of projects	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrghyzstan, Moldova, Mongolia, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan,
Criteria for support	The program supports activities that lead to a transfer of expertise and know-how, including training. Eligible activities must lead to: 1) Development of sustainable environmental policies and practices. 2) Promotion of harmonisation of environmental standards with European Union norms. 3) Improvement of energy technologies on both supply and demand side. 4) Promotion of sustainable use and management of natural resources, including energy saving, efficient energy usage and improvement of environmental infrastructure.
Contact: address	Tacis Information Office, 1000 Brussels, Wetstreet 200 (MO 19), 1049 Brussels Tel: 00-32-2-5459010 Fax: 00-32-2-5459011
Application procedure	Tendering
Available Budget	3,138 million Euro for the period 2000 to 2006
More information	http://europa.eu.int/comm/exter

9. The Government Program for the Support of the energy and fuels savings and utilisation of renewable sources of energy- Czech republic

Applicants	Profit and non-profit organisations settled in the Czech Republic
Location of projects	Czech Republic
Criteria for support	1) Provides a maximum of 30% of project cost. 2) Provides investments and also funds feasibility studies. Will fund projects involving renewable energy use, energy efficiency measures in industry, energy-efficiency measures in buildings, combined heat and power, efficiency improvements at power plants, energy plans and concepts for towns and municipalities, promotion, education, advice and training.
Contact: address	Czech Energy Agency, Vinohradská 8, 120 00 Praha 2, Czech Republic
Contact: e-mail	ceacr@ceacr.cz
Application procedure	Each year rules, descriptions and means of applications for the program is published.
Length application	5 months
Available Budget	8.5 million Euro

Experiences	Approximately 300 projects have been supported. Average contribution 12% of project costs. Minimum project cost 850 Euro and maximum project costs 86 mill Euro. Total support in1999 was 7.72 million Euro
More information	www.ceacr.cz

10. EkoFundusz (The EcoFund - debt to environment) - Poland

Applicants	Polish projects
Location of projects	Poland
Criteria for support	1) Minimum size for some project types e.g. 400 kW for biomass boilers, 100 m2 of solar collectors, 160 kW for wind turbines. 2) Applicant has to contribute at least 10% of project costs. 3) Eligible activities include renewable energy use, energy-efficiency measures in industry, energy-efficiency measures in building, combined heat and power (small and middle scale), and efficiency improvements at power plants.
Contact: address	Board of the EcoFund
Length application	6 months for big projects
Available Budget	33 Million Euro
Experiences	So far 138 projects have been executed, with a total support value of 110 Million Euro
More information	Contact directly

11. Global Environmental Facility (GEF)

Applicants	Applicants from World Bank approved countries. This includes accession countries
Location of projects	Developing countries and economies in transition
Criteria for support	1) Types of project supported are: a) Full-size projects - grants of more than $1m; b) Medium- Sized projects (grants of less than $1m), have to fill out project concept note c) Project Preparation & Development Facility (PDF). PDF A up to $25,000 funds early stage of project/program identification; PDF B up to £350,000 funds information gathering for proposal submission; and PDF C up to $1m for large project design & feasibility. 2) Any project, activity supported must be meet incremental cost criteria, be replicable. Can support capacity building to facilitate market - i.e. policy, technical, equipment, loan guarantees, and contingent financing. 3) GEF has 4 focal areas for funding: International waters, Biodiversity, Climate Change, Ozone depletion. Relevant for JI projects is Climate Change, where GEF funds projects like capacity building, and removal of barriers to implementation of renewables.
Contact: address	1818 H Street, NW, Sixth Floor, Washington, DC 20433, USA.
Contact: e-mail	http://www.gefweb.org/participants/Secretariat/Staff/staff.html
Application procedure	http://www.gefweb.org/How_Do_I_/how_do_i_.html
Length application	Varies

Required documentation	Contact directly
Experiences	In 1998 $2.75 billion pledged by member countries
More information	www.un.org/gef

12. National Energy Saving Programme for Financing Energy Efficiency in Municipalities - Hungary

Applicants	Hungarian Municipals
Location of projects	Hungary
Criteria for support	Facility will invest in energy-efficiency measures in building
Contact: address	Energy Centre of the Hungarian Government
Application procedure	The municipalities create a proposal, and submit it to the government. Once per year, the projects are evaluated.
Length application	Varies
Required documentation	Business plan and letter of intent
Available Budget	Around 10 billion HUF
Experiences	So far 17 projects have been supported. Average contribution 100% of project costs.

11.3 Risk Insurance and Guarantee Funds

1. MIGA (Multi Lateral Guarantee Agency)

Applicants	Project investors
Location of projects	Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Bosnia-Herzegovina, Republic of, Croatia, Cyprus, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Malta, Moldova, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Turkey, Turkmenistan, Ukraine, Uzbekistan
Criteria for support	1. An investor is required to remain at risk for a minimum of 5 percent of any loss. 2) Foreign investors (corporations or financial institution) must be a national of a member country other than the country in which the investment is MIGA ensures against the risk of a) currency transfer, b) expropriation, c) war/civil disturbance d) breach of contract. 3) In each risk category MIGA may guarantee equity investments for up to (i) 90% of investment contribution, (ii) an additional 450% of the investment contribution earnings attributable to the investment. For loans and loan guarantees, MIGA may guarantee (i) 90% of the principal, and (ii) an additional 135% of the principal to cover interest that will accrue. The investor is required to cover a minimum of 5% of any loss.
Contact: address	MIGA, 1818 H Street, N.W. Washington, D.C. 20433 USA.
Application procedure	Standard procedure open all year round.
Available Budget	1 billion Euro. A rise of budget to 1,8 billion Euro is

	considered.
More information	www.miga.org

2. European Investment Fund (EIF) (part of European Investment Bank)

Applicants	Project promoters
Location of projects	Europe
Criteria for support	1) Guarantees on debt finance to infrastructure projects including energy sector 2) Financing risk must be shared with banking sector. Financial institutions benefiting from EIF guarantees are allowed to allocate capital to those operations at a rate of 20% in accordance with EIF's status as a Multilateral Development Bank under the European Union's solvency ratio directive. EIF are prepared to consider very long maturates as well as exposures with longer grace periods in order to meet the expected cash-flow profile of the project. In the energy sector, the 3) EIF can support the following projects: transmission, storage and distribution of energy, e.g.: gas and oil pipelines storage, transportation facilities, electrical interconnections, and independent power generation projects including waste-to-energy plants.
Financial benefits	Guarantees for over € 5billion
Contact: address	43, avenue JF KennedyL-2968, Washington, USA
Application procedure	Contact directly, a specialist team will make a technical and economic feasibility appraisal.
Length application	Varies
Required documentation	Varies
More information	www.eif.org

3. Export Credits Guarantee Agency – United Kingdom

Applicants	UK firms only
Location of projects	Covers accession countries
Criteria for support	Provide insurance assistance to exporters of UK capital goods & services; Will cover commercial & political risks for power projects in Accession countries. Beginning to consider what additional products and cover might be required to meet climate change linked project investments. Focus to date fossil fuel based power projects.
Contact: address	PO Box 2200, 2 Exchange Tower, London E14 9GSUK
Required documentation	Varies - will include business/development plans, contracts etc
Available Budget	Provide policies worth over £3 billion cover every
More information	Contact directly

4. Aon Global Risk Consultants Ltd

Applicants	Any company or Government
Location of projects	All accession countries

Criteria for support	1) Aon can provide risk products (risk transfer) for all project finance components, and are developing carbon trading risk products. Very important for any forward sales of credits. 2) Must be a financially feasible project.
Contact: address	Aon Global Risk Consultants, 8 Devonshire Square London, EC2M 4PL.
Application procedure	No formal application procedure, contact direct
Experiences	Global including power projects
More information	Contact directly

5. Swiss Re - New market Risk Mitigation

Applicants	Open
Location of projects	Open
Criteria for support	a) Risk mitigation products - conventional. b) Also beginning to develop risk mitigation products in relation to project carbon credit risk, and other elements of the carbon market. They are at the feasibility stage, and are actively looking for projects to work on.
Contact: address	see e-mail
Contact: e-mail	loredana_mazzoleni@swissre.com
Application procedure	Varies
Length application	Varies
Required documentation	Varies
More information	Contact directly

11.4 Loans

1. International Bank for Reconstruction & Development (IBRD) Hedging (risk) Products - World Bank group

Applicants	Members that are creditworthy for IBRD lending and who are servicing their existing debt obligations to the IBRD are eligible for new loans on IBRD terms.
Location of projects	The IBRD provides financial products to middle-income countries and creditworthy poorer
Criteria for support	IBRD is offering a range of financial risk management tools: In particular, they include: i) interest rate conversions or swaps; ii) interest rate caps and collars; iii) currency conversions or swaps; and iv) commodity swaps (offered on a case-by-case basis).
Contact: address	Financial Products and Services Department, 1818 H Street, N.W. Washington, D.C. 20433 U.S.A.US
Contact: e-mail	FPS@worldbank.org
Application procedure	http://www.worldbank.org/fps/q&a.html
Length application	Varies
Required documentation	Varies
More information	http://www.worldbank.org/fps/q&

2. European Investment Bank (EIB)

Applicants	Project promoters in public and private sector
Criteria for support	Projects that fulfil the EU's objectives. Generally the Bank will fund projects with a satisfactory rate of return, which varies from project to project. There exist different kind of loans: 1) Individual loans, in excess of EUR 25 mill and up to 50% of investment cost. Maturities in industrial sector up to 12 years, for infrastructure up to 20 years, or more in exceptional cases. 2) Global loans. Loans up to EUR 25 mill, must not exceed 50% of project cost, for projects undertaken by SMEs or local authorities in the case of small infrastructure projects. Maturities between 5 and 12 years, or in exceptional cases 15 years. Direct loan up to +EUR 25 mill
Contact: e-mail	information@eib.org
Application procedure	Varies
Length application	Varies
Required documentation	Varies
Available Budget	1999: total of EUR 31.8 billion
Experiences	In 1999 - Czech Republic: EUR 25 million to HypoVerinsbank for financing small & medium-scale ventures. Estonia: €20 million for to Eesti Uhispank for financing small & medium-scale ventures. Hungary: €20 mill loan for construction of CHP plant for energy supply to chemical production facility, €15 mill for CHP plant, €30 mill to Raiffeisen Bank and €20 to Bank Austria Ceditanstalt for financing small & medium-scale ventures. Poland: €100 mill to

	HypoVerinsbank Polska and €47 mill to BRE Bank for financing small & medium-scale ventures.
More information	http://www.eib.org/loans/information.ht

3. International Bank for Reconstruction & Development (IBRD) Lending Instruments Facility

Applicants	Members that are creditworthy for IBRD lending and who are servicing their existing debt obligations to the IBRD are eligible for new loans on IBRD terms.
Location of projects	The IBRD provides loans to middle-income countries and creditworthy poorer countries.
Criteria for support	Most IBRD loans are for specific investment projects or programs, including energy. The IBRD currently offers three types of financial products for new loan commitments: Fixed-Spread Loans (FSLs); Variable-Rate Single Currency Loans (VSCLs); and Currency Pool Loans (CPLs). These products define the financial terms of IBRD's different lending instruments. See web-site for further information.
Contact: address	Financial Products and Services Department, 1818 H Street, N.W. Washington, D.C., 20433, U.S.A.
Contact: e-mail	FPS@worldbank.org
Application procedure	http://www.worldbank.org/fps/q&a.html
Length application	Varies
Required documentation	Varies
Available Budget	Varies
More information	http://www.worldbank.org/fps/q&

4. European Bank for Reconstruction and Development (EBRD)

Applicants	CEE countries
Location of projects	CEE countries
Criteria for support	1) Bank supports particularly projects that meet transition objectives, financial contribution 30 - 40% of total project costs 2) IRR 20%, but if there is a significant transition effect 10-15%. JI/ET could fit transition criteria; Key considerations are terms of PPA and the strength of the sponsor 3) Private or Government guarantees required.
Kind of projects	4) EBRD will consider renewable energy, energy efficiency, CHP, and retrofitting projects.
Min-max project costs	Approximately 20 - 600 million EUR
Contact: address	Power & Energy Utilities, One Exchange Sq. London EC2A 2JNEU
Application procedure	Case by case decisions
Length application	Varies
Required documentation	Varies
Available Budget	Current portfolio 1.2 billion EUR, target 1.5 - 1.6 Billion
More information	www.ebrd.com

5. National Energy Saving Program Energy Saving Credit Fund - Hungary

Applicants	Profit and non-profit firms settled in Hungary
Location of projects	Hungary
Criteria for support	1. Minimum contribution applicant 25% of project costs. 2. Fund will consider projects in the following categories: energy-efficiency measures in industry, energy-efficiency measures in building, combined heat and power, and efficiency improvements at power plants
Contact: address	The Energy Centre of the Hungarian Government.
Application procedure	Varies.
Length application	1-3 months.
Required documentation	Feasibility study, and business plans.

6. The Government Program for the Support of the energy and fuels savings and utilisation of renewable sources of energy - Czech Republic

Applicants	Profit and non-profit organisations settled in the Czech Republic.
Location of projects	Czech Republic
Criteria for support	1) Applicant has to fund 40% of the project costs. Subsidy or loan covers 60% of total project costs. The usual interest rate of the commercial loan is 9-14% at the Czech bank and 6-8% at the foreign bank. The interest rate from the NEF is 2% for the municipalities 5% for other clients. 2) Facility will consider renewable energy, and Combined Heat and Power projects.
Contact: address	National Environmental Fund, Kaplanova 1931/1, 148 00 Praha 4, Czech Republic
Contact: e-mail	ispevak@sfzp.cz
Application procedure	Tender: Proposals can be sent during the whole year, 4 times per year the committee makes a selection, which then has to be approved by minister.
Length application	5 months
Required documentation	Financial analysis, and business plan.
Available Budget	7.5 million Euro
Experiences	110 projects have been supported so far.
More information	www.sfzp.cz

7. Estonian Innovation Fund - Estonia

Applicants	Profit and non-profit firms as well as consumers settled in Estonia
Location of projects	Estonia
Criteria for support	1) projects must be innovative. 2) In the case of equity financing the fund shall have no less than 1/3, and no more than 49% of the total share of capital. 3) The minimum contribution to project costs by an applicant is

	25%. 4) Implementation of research or development work which brings general economical or social benefits. 5) For the development of infrastructure supporting the innovation. In 1999 the loan interest was between 8% and 10% with the average commercial interest rate being approximately 12%.
Contact: address	Eesti Innovatsioonifond
Length application	1 month (as the money comes mostly via state budget
Required documentation	Application, Business Plan and Feasibility Calculations (Feasibility Study if avail-able), any other relevant to the project financing is applied for.
Available Budget	0,7 million Euro
Experiences	At the end of 2000 the 4 funds of the Estonian Innovation Fond (Subsidy, Low-interest loan. Third party financing, Guarantee Fund) will be united and shall be established Estonian Entrepreneur Development Foundation and shall give only grants in future.
More information	Contact directly

8. The loan programme for environmental investments - Slovenia

Applicants	Profit and non-profit organisations in Slovenia
Location of projects	Slovenia
Criteria for support	Max 80% of project investments**.** The following project types will be considered for support: 1) Renewable energy use 2) Energy-efficiency measures in industry 3) Energy-efficiency measures in building 4) Combined Heat and Power 5) Efficiency improvements at power plants
Contact: address	ECOFUND, Trg republike 3, 1000 Ljubljana, Slovenija. Telephone: +386 01-241-48-20 Fax: +386 01-241-48-60 Ljubo Žužek, Managing Director Darko Koporcic, Assistant to Managing Director for Project Implementation
Contact: e-mail	Darko.koporcic@ekosklad.si
Application procedure	Annual Tender Decision by committee
Length application	0.5 months
Required documentation	Business plans and feasibility studies are sometimes necessary.
Available Budget	In the year 2000: 700 Million SIT
Experiences	More than 200 projects mainly small projects in the area of renewable energy.
More information	Contact directly

9. Credit Lyonnais Loans

Applicants	Open.
Location of projects	Will consider any country accession countries included.
Criteria for support	Depend on the whole project structure. IRR, risks & guarantees available, sponsor - must be strong credit worthy.
Kind of projects	Financed wide range of projects including power sector.
Contact: address	Structured Finance, PO Box 81, Broadwalk House, 5 Appold Street, London EC2A 2JP.
Contact: e-mail	martin.bartlam@creditlyonnais.co.uk
Application procedure	No formal procedure.
Length application	Varies.
Required documentation	Varies.
Available Budget	Not applicable.
Experiences	Financed a wide range of projects including power sector types.
More information	Contact directly.

10. Webb Partnership – United kingdom

Applicants	Open.
Location of projects	All countries eligible.
Criteria for support	Corporate and project financing of environmental solutions including emission reductions.
Financed activities	Will assist in financing preliminary stages - plans, marketing etc, in the start-up phase.
Min-max project costs	Specialise in providing funding up to £.300,000.
Contact: e-mail	wheb.partnership@virgin.net.
Available Budget	They have two funds one is a smaller trust fund (£2 mill) and the other is a larger fund (£20 mill) which is due to be launched in October 2000.
Remarks	Preliminary stages of operation.

11. Private banks that provide debt/loans to projects - Estonia Hansapank, Ühispank, Optiva Pank, Merita Pank

Applicants	Applying body must be registered in Estonia.
Location of projects	No restrictions.
Criteria for support	1) SPOT should not exceed 8 years. 2) Loan servicing ratio approx. 1,4. 3) Applicant has to contribute minimum of 20%, and the average is approximately 34% of project costs. 4) Insurance is required.
Min-max project costs	Minimum costs approximately 3,000 EURO. Maximum costs approximately 20,000,000 EURO.
Application procedure	Varies
Length application	2 months
Required documentation	Loan application procedure. .

12. International Finance Corporation (IFC)

Applicants	Company must have a majority private sector share holding.
Location of projects	Albania; Armenia; Belarus; Bosnia-Herzegovina; Bulgaria; Croatia; Cyprus; Czech Republic; Estonia; Georgia; Hungary; Latvia; Lithuania; FYR of Macedonia; Moldova; Poland; Romania; Russian Federation; Slovak Republic; Slovenia; Turkey; Ukraine.
Criteria for support	The project must be in the private sector, technically sound, benefit the local economy and have a good prospect of being profitable. In relation to long-term loans (8-12 years), IFC is never the largest single investor, only a passive, long-term investor. Maximum participation of 25% of project costs.
Min-max project costs	Small-medium projects: $100,000 - 1 mill; standard size $ 1mill - 100 mill
Contact: address	See http://www.ifc.org/
Application procedure	No standardised procedures. Applications can be submitted all year round.
Required documentation	After initial contacts and preliminary review the IFC will require a detailed feasibility or business plan.
More information	http://www.ifc.org/