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GREEN INVESTMENT SCHEMES: OPTIONS AND ISSUES

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FOREWORD

This document was prepared in November 2003 by the IEA Secretariat at the request of the Annex I Expert Group on the United Nations Framework Convention on Climate Change. The Annex I Expert Group oversees development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. These papers may also be useful to national policy makers and other decision-makers. In a collaborative effort, authors work with the Annex I Expert Group to develop these papers. However, the papers do not necessarily represent the views of the OECD or the IEA, nor are they intended to prejudge the views of countries participating in the Annex I Expert Group. Rather, they are Secretariat information papers intended to inform Member countries, as well as the UNFCCC audience.

The Annex I Parties or countries referred to in this document refer to those listed in Annex I to the UNFCCC (as amended at the 3rd Conference of the Parties in December 1997): Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, the European Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America. Korea and Mexico, as new OECD member countries, also participate in the Annex I Expert Group. Where this document refers to "countries" or "governments" it is also intended to include "regional economic organisations", if appropriate.

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Executive Summary

The Kyoto Protocol establishes greenhouse gas emissions targets for the period 2008-2012 for industrialised country Parties and agrees on a number of common approaches to be used to implement those targets. Emissions trading allows countries with surplus emissions allowances to sell to countries that require additional emissions allowances in order to meet their targets. The scale of the financial transactions globally could be in the range €1.25 – 3.5 billion per annum. This is a very approximate figure, and depends on the balance of supply and demand and the prevailing allowance price. Certain countries with economies in transition have commitment targets that are well in excess of their current emissions.

Green Investment Schemes (GIS) have been discussed as a way of promoting the environmental efficacy of transactions that involve such surplus allowances. The idea would be to ear-mark funds generated from the sale of allowances for use in environmentally-related projects. The GIS would be set up by the seller countries, and would operate as a domestic scheme within their climate policy framework, with operational details to be agreed on a bilateral basis between buyer and seller nations. If supported by the international community for its environmental effectiveness, GIS schemes could be broadly relevant to those non EU-accession countries with economies in transition (EITs) that have surplus AAUs.

To date, no projects have been funded under a GIS. Despite discussion in the literature, real progress in setting up such schemes is limited. This is probably due to uncertainties relating to the current ratification status of the Kyoto Protocol, and in advance of the Protocol's entry into force, it is difficult to discern the true level of political support for the idea. Nevertheless, previous work has identified a need on the part of buyers to find a way to 'green' the surplus allowance transactions (Tangen et al (2002)).

This paper explores the pros and cons of setting up such a scheme, identifies some policy and funding gaps that GIS could fill, and investigates some of the issues that would arise if such a scheme was implemented. Four hypotheses of the potential benefits are investigated:

Hypothesis 1*: A GIS provides a mechanism for freeing-up payments for AAUs, providing EITs with a revenue stream, earmarked for environmental purposes, that otherwise might not be forthcoming. This reduces the risk that countries will not be able to sell their surplus allowances, and, particularly in the case of Russia, strengthens the case for ratification of the Kyoto Protocol.*

> **Conclusion**: Any agreement on GIS will come after Kyoto ratification, so there will not be any direct causal link. However, GIS does potentially provide a way of adding value for both sides of the emissions trading transaction process. The promise of such schemes could therefore be a positive influence in the political decision on ratification.

Hypothesis 2*: A GIS provides a mechanism that would be useful in the context of future climate negotiations, allowing earmarking of revenues from international transactions to be put towards environmental spending.*

> **Conclusion**: There are many different structures being considered for future climate agreements. It is likely that a GIS-type mechanism would add to the complexity of the system, and would not necessarily add significantly to the environmental benefits of an international trading system.

Hypothesis 3*: A GIS accelerates investment in emission reduction projects that would not otherwise have happened, by addressing lack of access to capital and other barriers to investment. By setting the selling party on a less greenhouse-gas intensive path, it could commit to reductions in future commitment periods beyond what it would otherwise have accepted.*

> **Conclusion**: The overall conclusion of the paper is that there are other mechanisms, such as domestic emissions trading regimes and JI, that are well suited to stimulating emissions reductions for many types of projects. Any GIS will need to layer into the Kyoto mechanisms, and should be designed so that it enhances rather than limits the effective operation of these mechanisms. Under this definition, activities that could be usefully supported by a GIS include: i) support for small projects or projects from sectors that are not well-suited to direct involvement in emissions trading, ii) support for advanced technology solutions (including for example renewables, advanced electricity generation technologies etc) that would otherwise be excluded from trading (and JI) schemes on the basis of price, iii) offsetting some of the financial risks for JI projects associated with uncertain and volatile carbon prices that would otherwise restrict access to capital.

Hypothesis 4*: A GIS allows funding to be channelled towards capacity-building activities. Funds could support both domestic policy actions on climate mitigation, as well as strengthening the capacity to implement the Kyoto Protocol (e.g. improved monitoring, inventories etc). This would reduce the uncertainty relating to targets set in the negotiations, and would strengthen the ability of countries to reduce emissions.*

> **Conclusion**: Development and strengthening of domestic policies and strategies is key to taking effective action on climate change mitigation, and a good use of GIS funds would be to develop capacity for these activities.

Earmarking of funds as proposed for the GIS is subject to a general concern that it can divert mainstream funds away from environmental expenditure within the domestic budgetary process. This suggests that GIS should be restricted to the short-term. In the longer term, the issue of 'hot-air' may be better resolved within the framework of the international climate negotiations, or by integrating the issue into the broader energy dialogues between buyer and seller nations, rather than through a separate mechanism.

Nevertheless, current political realities point to the need for a short-term solution to the existing surplus allowances held by EIT countries, and in practice over the short-term, GIS may supplement rather than erode existing internal sources of funding, which are relatively scarce. This paper points to several areas where GIS may be able to fill short term policy and funding gaps.

Given the potential size of the financial flows involved, there will be legitimate concerns about the financial and technical risks involved in setting up a GIS scheme. The potential benefits will only accrue if the funds can be managed in a transparent and accountable way – strong, transparent governance is needed to deliver environmental and economic benefits, as well as to build confidence in the scheme, which would attract potential investors. The technologies supported must also be robust to the conditions in which they will be expected to operate, and the scheme will need to establish strong monitoring and evaluation procedures for projects. Subject to these caveats, a GIS has the potential to deliver real benefits by directing otherwise scarce resources to environmental projects.

1. Introduction

1.1 What are Green Investment Schemes?

The Kyoto Protocol has established targets for greenhouse gas emissions commitments on a country-by-country basis and a set of flexibility mechanisms whereby industrialised country Parties can transfer emission allowances if their emissions are below commitment levels. Recognizing the special circumstances of countries with economies in transition (EITs) – the sharp economic recession that followed the fall of the Soviet bloc[1] – these countries were allocated emission commitments, so-called "assigned amounts", sometimes well above their emissions at the time. Arguably, the commitment level surplus would allow these countries' emissions to grow as their economies recover, but current emission trends suggest that some surplus credits would also accrue. However, as greenhouse gas (GHG) emissions are not likely to rise as rapidly as anticipated, most transition economies have the possibility to sell the surplus assigned amount units (AAUs), the emission allowances as defined under the Kyoto Protocol[2].

By its sheer size (as well as its emission stabilisation rather than reduction target), the Russian Federation is projected to have a large quantity of AAUs potentially available for transfers as soon as it becomes eligible to trade. A number of countries and stakeholders have recognised the need to address the negative perceptions that surround the transfer of these AAUs (somewhat pejoratively referred to as "hot air") as they allow for increased emissions on the buyers' side without any mitigation effort on the seller's side. Up until 2001, projections of future GHG emissions showed that OECD countries needed to rely extensively on AAUs and other Kyoto mechanisms to achieve compliance. However, with the United States now outside the Kyoto market, the volume of demand is greatly diminished. Potential sellers stand to gain less than initially anticipated, since traded volumes and prices of AAUs should be lower than they would have been with the full set of industrialised countries in the market.

The purpose of Green Investment Schemes (GIS) is to promote the environmental efficacy of transfers of excess AAUs, by earmarking revenues from these transfers for environmentally-related purposes in the seller countries. This should act to improve the marketability of AAUs from some seller countries (Korppoo, 2003).

Although in principle a GIS could be set up as a multi-lateral structure, in practice discussions on GIS are concentrating on implementation as a series of bi-lateral agreements. Under this approach, seller governments would set up a GIS as a way of channelling funds into climate activities, boosting domestic climate mitigation efforts. Bilateral agreements would then be made with buyer countries concerning the types of projects to be funded, as well as arrangements for tracking the funds and monitoring progress of projects.

One proposal for a GIS was formally introduced by the Russian Federation at COP6 in December 2000. Its operational details have not been elaborated, but already the concept has generated considerable discussion and research about its implementation[3] (Tangen et al. 2002). If broadly supported by the international

[1] As an illustration, the Russian Federation's GDP (using purchasing power parities) fell from 2,367 to 1,024 billion US$ between 1989 and 1997.

[2] The IEA (2002) World Energy Outlook projects energy-related CO_2 emissions of Russia, Ukraine and other transition countries to be some 860 $MtCO_2$ or 25% below their collective targets by 2010.

[3] Representatives of the Russian Federation have mentioned that they had held bilateral discussions on the GIS with Canada, Japan and Sweden.

community for its environmental effectiveness, the GIS could apply to other countries with economies in transition (EITs) with surplus AAUs.

The purpose of this paper is to describe and explain GIS, including various options presented in the literature, consider its integration in the Kyoto Protocol framework, give an overview of the current status of discussions on GIS, and discuss how GIS fit in with alternative mechanisms to secure GHG mitigation efforts.

In summary, the paper concludes that in the long term, there may be more efficient ways of dealing with the problem of 'greening' the AAU transactions, either through the structure of the Kyoto negotiations, or by linking the issue to ongoing energy dialogues between the buyer and seller nations. In the short term however, Kyoto transactions could provide a useful source of funds to support a range of environmentally related activities.

The remainder of this section sets out the principle reasons why Green Investment Schemes are on the agenda. Section 2 then explores each of these reasons in more detail to identify where there might be policy gaps that GIS could fill. Section 3 goes on to discuss in more detail some of the issues that would arise if GIS were to be implemented. Finally, Section 4 presents conclusions.

1.2 Sellers' and buyers' interest in GIS

For a Party that sets up a Green Investment Scheme, the main purpose of such a system is to have access to a market, to buyers, that would otherwise be reluctant to acquire AAUs from this Party. The selling Party's situation is clearly improved: increased revenues, and funding for projects that could not be implemented as easily without it. If successful, the GIS would also promote climate policy in selling countries, contributing to lower emissions and, potentially more ambitious mitigation commitments in the future.

The most likely candidates for setting up such schemes would be Annex I countries with economies in transition (EITs) that are not in the first wave of EU accession. By far the largest of these in terms of surplus allowances are Russia and Ukraine, but with Bulgaria and Romania also likely to have significant potential.

Those countries that are heading for early accession to the EU[4] are likely to be constrained in the extent to which they can sell AAUs by the range of demands of EU climate policy, notably involvement in the EU emissions trading scheme. Emissions surpluses from the new member states are likely to be managed under the umbrella of the enlarged EU, making GIS less relevant.

A range of interests in GIS exist on the buying side:

- Promoting the environmental efficacy of the Kyoto Protocol, including the trading mechanisms, by addressing the negative perceptions that surround trading of surplus AAUs;

- Protecting the case for domestic action and technology development in the net buying countries. Depending on how it is designed, the GIS could lead to higher prices, which might help insulate these domestic markets from the very low carbon prices that might otherwise be implied by international surpluses;

[4] Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia

- Maintain access to and develop a future supply of low cost allowances, within the context of the needs to meet Kyoto targets at politically acceptable costs;

- Integrate the negotiations on access to AAUs with broader dialogue on energy trade and cooperative efforts on energy sector investments;

- Develop the opportunity for buyer countries to leverage involvement of their private sector companies in resulting projects;

- Increase the attractiveness of the trading environment for sellers in order to encourage Kyoto ratification by Russia.

This diverse set of requirements on the demand side of the equation is leading to a highly differentiated market, and is linked to the whole issue surrounding the valuation of the 'quality' of emissions reductions. The market 'ideal' of a single international market price for carbon is a long way off given all these competing requirements (also see OECD 2003a). The emerging market is showing signs that companies are prepared to pay premiums for projects that are perceived as risk-free (from a reputational and political perspective), to some extent being encouraged by the NGO community (WWF 2002), typically in renewable and end-use energy efficiency applications.

It should be noted here that although the GIS concept is referred to quite substantially in the emissions trading literature, there is very little progress on actual implementation. This is probably largely due to the uncertainties associated with Kyoto ratification, but until this hurdle is overcome, it may not be clear to what extent there is real political support for GIS.

1.3 Objectives of Green Investment Schemes

As stated above, the overall reason for the emergence of the GIS concept is to address concerns about the environmental efficacy of emissions trading when faced with a surplus of allowances. This section hypothesizes four specific objectives that might be expected to be achieved through the implementation of a GIS.

Hypothesis 1
The GIS provides a mechanism for freeing-up payments for AAUs, providing EITs with a revenue stream, earmarked for environmental purposes, that otherwise might not be forthcoming. This reduces the risk that countries will not be able to sell their surplus allowances, and, particularly in the case of Russia, strengthens the case for ratification of the Kyoto Protocol.

Hypothesis 2
The GIS provides a mechanism that would be useful in the context of future climate negotiations, allowing earmarking of revenues from international transactions to be put towards environmental spending.

Hypothesis 3
The GIS accelerates investment in emission reduction projects that would not otherwise have happened by addressing lack of access to capital and other barriers to investment. By setting the selling party on a less greenhouse-gas intensive path, it could commit to reductions in future commitment periods beyond what it would otherwise have considered.

Hypothesis 4
The GIS allows funding to be channelled towards capacity-building activities. Funds could support both domestic policy actions on climate mitigation, as well as strengthening the capacity to implement the Kyoto Protocol (e.g. improved monitoring, inventories etc). This would reduce the uncertainty relating to targets set in the negotiations, and would strengthen the ability of countries to reduce emission.

In Section 2, this paper examines the effectiveness of GIS in achieving these objectives compared to other policy options. Some of the design and implementation issues arising from meeting the different objectives are discussed in Section 3.

2. Where Does GIS fit in to the Policy Framework?

As stated in the introduction, the principle reason for the emergence of the GIS concept has been the concerns of buyers to enhance the environmental efficacy of wholesale emissions trading transactions with Russia and other EITs, and a desire on both sides of the trading transaction to increase the value (both quantitative and qualitative) associated with the emissions allowances. In this section, we look in more detail at how GIS fits in with other policy options, and how effective it could be in delivering the expected benefits. Each of the four objectives hypothecated in Section 1.3 are examined in more detail in the following sections.

2.1 Encouraging Kyoto Ratification

The final negotiations at Kyoto implied that EITs would gain some benefit from being allocated more allowances than their projected emissions during the commitment period. This was politically acceptable taking into account reductions to date in these countries, equity considerations, and the need for EITs to be allowed to grow their economies without a CO_2 constraint. For some countries, the size of the surplus turned out to be larger than expected because of the severity of the economic downturn, and the slower than expected recovery. The need for Kyoto to deliver some economic benefits to EITs nevertheless remains, although these benefits appear to be threatened because some potentially buying countries are questioning the validity of such financial transfers.

GIS may alleviate this problem. Buyers' requirements to be spending money in an acceptable way should be satisfied. By allowing EITs to invest revenues from emissions trading in projects that are strategically important to them, whilst also delivering environmental improvements, the promise of economic benefit from Kyoto is rekindled.

There is a question about whether this will help persuade Russia to ratify the Kyoto Protocol. The practical implementation of GIS will not occur until after ratification, and some have argued (Tangen et al 2002) that the promise of economic benefits could be a significant factor, and the ability to free-up these benefits through mechanisms such as GIS would help provide a spur to making a positive decision.

2.2 Provide environmental benefits in future commitment periods

Some commentators suggest that a GIS can be used to 'green' transactions of AAUs. This stance implies that trading without a GIS is not 'green', an assumption that deserves some scrutiny, since it could have implications for future commitment periods.

The reason why there are likely to be excess allowances in the first commitment period is that EIT countries were given headroom to grow their economies. The fact that the size of the excess may turn out to be larger than was originally envisaged simply reflects the uncertainties associated with the ex-ante negotiating process, which rely on assumptions about the extent of economic growth, the linkage between emissions and growth, participation of Parties in the Protocol etc. These types of uncertainty will continue to be present in the future, and will be reflected in the overall price of allowances and the level of trade between different countries.

The environmental efficacy of the global climate negotiations rests on the stringency of the total reduction target. A measure of this stringency is the price of AAUs. If the price is low, it implies that relatively little additional abatement will be stimulated. If such a situation were to persist in future commitment periods, it could indicate a problem that should be fixed within the central framework for setting the overall targets. If the overall targets are right, the system will automatically be 'green', without the need for a bolt-on solution in the form of GIS.

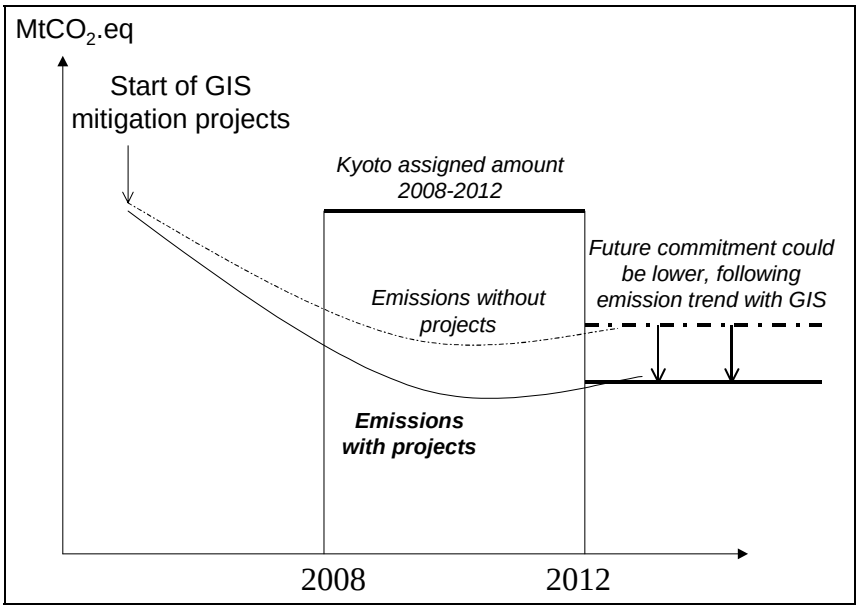
An additional unresolved concern raised by GIS in this context is the problem associated with earmarking as a way of funding environmental activities – namely that it diverts political attention away from the need to mainstream environmental expenditure. If environmental funds are available from an earmarked or external source, this amount can simply be deducted from the budgets of Environment Ministries, undermining the intended environmental benefits of the scheme.

This concern points to the need for different approaches in the long term that do not rely on ear-marked funds, although this is a complex issue in many countries, since the environmental effectiveness of earmarking depends on the financial conditions within the country concerned.

2.3 Bringing forward investment in emissions-reduction projects

GIS would encourage investment in emissions-reduction projects by providing additional capital that is otherwise scarce. By setting the selling Party on a less greenhouse-gas intensive path, it could encourage it to commit to reductions in the second commitment period beyond what it would have considered, had it not implemented these projects.

Figure 1: How additional projects can benefit the global environment



2.3.1 Policy Alternatives

The GIS can essentially act like a carbon fund, providing a source of finance for particular emission-reduction projects. How does the GIS compare to the policy alternatives for meeting the same objective (i.e. of bringing forward emissions reductions)? Two main alternatives can be envisioned: the use of the JI

mechanism, and setting up a domestic emissions trading scheme in the seller country which could then be linked to domestic schemes in other regions. The discussion below compares these two policy alternatives to GIS.

The first alternative of using JI provides the advantage that the mechanisms for JI are agreed at a multilateral level, which increases the credibility and transparency of project funding. Investments in JI projects should certainly meet buyer country concerns about environmental integrity, and the projects themselves would gain similar financial benefits to that under GIS by using early crediting as follows[5]. A host country decides to credit Joint Implementation projects for all reductions achieved before 2008; because Joint Implementation projects can only generate ERUs in 2008 onward, early reductions are transferred as AAUs, taken from the country's surplus. These AAUs therefore correspond to actual reductions, verified under a standard JI procedure, but these have taken place prior to 2008. The principle is simple and is already being used, e.g. in a Finnish JI project in Estonia (Emp-Projects Oy, 2002).

Buyers of such AAUs can point to actual projects that have generated the corresponding reductions. This leads to fewer AAUs available for 2008-2012 compliance, and therefore lower emissions in that period. JI implies direct access of the projects to the international emissions trading market, with approval given by an institutional body in the seller country. This is likely to provide for greater transparency and accountability for large projects than GIS.

The second alternative to GIS for promoting additional projects is to establish a domestic emissions trading scheme for large emitters that have suitable emissions inventories. Allowing the private sector and other emitters to receive proceeds directly from international emissions trading provides an incentive to reduce emissions. This would allow decisions to be taken at the company level on where the most cost-effective emission reduction investments are, arguably the most efficient place for such decisions to be taken.

There may be fairness issues raised when allocating excess AAUs under such a system: some sectors or sources that have undergone declining emissions since 1990 may request that some of the excess AAUs be allocated back to them. This is the essence of the proposal for a Carbon Energy Fund put forward by Russia's United Energy Systems (RAO-UES): it asks for a domestic cap on emissions, with part of the sector's surplus from 1990 level emissions allocated as well, to be recycled into further reductions. On the other hand, allocating to various sectors according to their contribution to past reductions may have important distributional effects[6].

The ability of a company to sell allowances on the international trading market will depend on the credibility of the domestic emissions trading scheme. This in turn depends on many issues, including the robustness of monitoring and reporting, and the stringency of the initial allocation. If the allocation is too lenient, then the concerns about 'hot air' may simply be delegated down to the company level, and the company may have difficulty accessing markets.

Certainly, there are organisational difficulties of setting up domestic trading schemes, and it is not clear how such schemes will be recognised by existing national or regional schemes. Nevertheless, since domestic schemes are likely to be an important part of future climate policy structures in many EITs, there would be benefits in bringing such schemes forward.

[5] See Evolution Markets (2001), and PCF (2002).

[6] For instance, total final energy consumption in the residential sector in Russia has declined less than industry energy use, whereas it's argued that the potential for energy efficiency improvement in Russia's buildings is large, but also cost-effective (IEA, 2002, *Russia Energy Survey 2002*; Chandler, 2000).

One of the advantages of domestic emissions trading as a tool to connect a country's mitigation options to the international market is that it would eventually carry lower transaction costs than carbon funds (Evans, 2003). In addition, carbon funds may carry a higher risk of mismanagement of funds allocated for mitigation projects. Evans (2003) also points out the difficulty for a country to move from a government-controlled fund for mitigation to a more decentralised and market-friendly system of domestic emissions trading in which entities, not governments, would own AAUs.

These alternatives may differ from the GIS in their effects on global carbon markets. While GIS could be organised so as to support carbon prices in transactions at the governmental level, domestic emissions trading schemes would introduce additional low-cost reductions from EITs, reducing the price of carbon in private-sector markets. JI with early crediting would achieve something different: additional emission reductions would be achieved before the commitment period, reducing aggregate emissions over the period.

In summary, JI and domestic emissions trading schemes can in principle (provided there is sufficient institutional capacity to support the mechanisms) provide an appropriate route for encouraging additional investment in climate-related projects. Therefore, GIS should only be considered if it adds to the effective operation of domestic trading schemes / JI, or fills gaps that are not effectively covered by them. The next section outlines where such gaps might occur.

2.3.2 Project-financing gaps that could be filled by GIS

In principle, the presence of an international market for CO_2 emissions reductions should stimulate JI projects to be undertaken up to the point at which the marginal cost of emission reduction equals the market carbon price (illustrated as area A+B+C in Figure 2). In practice, particularly in the early stages of the market, there are likely to be significant barriers, and JI may not deliver all the expected savings.

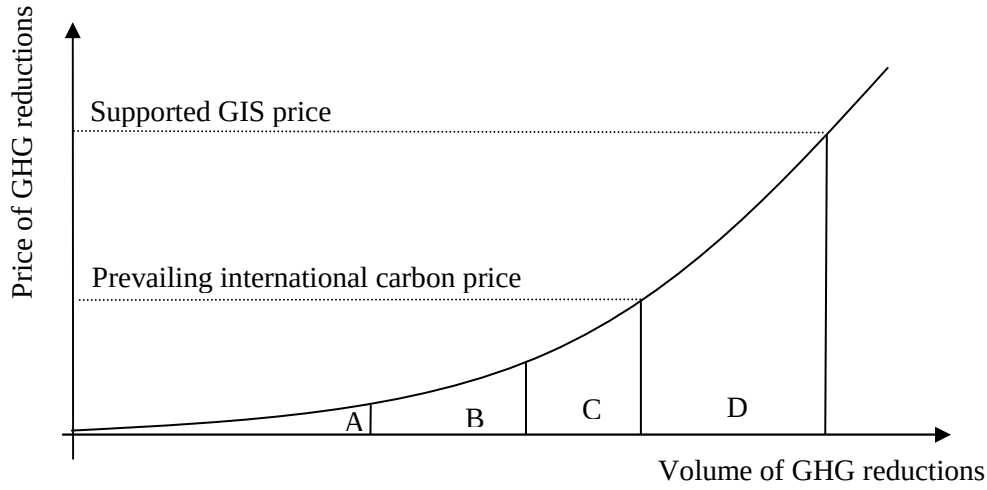
Small projects often provide large potential for cost-effective savings (illustrated as area A in Figure 2). However, the transaction costs of packaging these up as JI projects may simply be too high, and this portion of the savings curve may not be stimulated by JI. Other policies and measures will be better suited to accessing these emissions savings.

For larger projects, JI could be more feasible, but price uncertainty and volatility could restrict access to the additional capital required to fund such projects. In practice, projects will probably be restricted to those that deliver savings well below the prevailing international carbon price (illustrated as area B below) because of the much lower financial risk they would carry. In order to stimulate the additional projects represented by area C, some type of price support may be necessary to offset the associated risks.

In addition, it may be possible to be significantly more ambitious with a GIS fund than would otherwise be the case with a potentially limited international carbon price. By supporting higher carbon prices, the GIS might enable pump-priming investments in advanced technologies, thereby initiating a leap-frog in technology choice. This is illustrated as area D.

The way in which GIS might fill these potential gaps is explored in more detail in Section 3.2.

Figure 2: Cost structure of projects that could be stimulated by raising the carbon price



2.4 Funding broader climate policy packages

One of the expected benefits of a GIS, raised by Tangen et al (2002), as well Koch & Michaelowa (1999), is that it could support broader packages of climate policy measures with more flexibility than are implied by the relatively narrow project-based mechanisms. Such packages could include investments that would lead only indirectly to emissions reductions, or to emissions reductions that are difficult to measure.

For example, funding could be broadened out to include technical assistance programmes on issues such as measuring and reporting, establishing inventories, improving statistics collection procedures, and supporting more generic information and outreach type climate policies. This should also lead to reduced uncertainty and the negotiation of more intelligent targets for these countries in future commitment periods, as well as putting the country in a stronger position by increasing its understanding of how to comply with targets. By increasing EIT countries' ability to make good decisions, such institutional strengthening should result in better environmental outcomes from the international negotiating process.

The financial mechanisms of the Convention may not be sufficient to promote these types of activity, and this therefore seems to be a possible beneficial niche for GIS. In principle, it seems an elegant solution to the problem of excess allowances; use the associated revenues to strengthen the countries' overall climate negotiation and compliance positions, although expenditure on such activities would be small compared to total Kyoto revenues. Further discussion of this type of project is given in Section 3.2.

3. Implementing GIS

The previous section outlined several areas where there may be policy and funding gaps that GIS could potentially fill. In this section, the paper examines some of the issues that would arise should a country decide to embark on implementation of a GIS. Section 3.1 looks at the potential scale of the financial flows in order to get some perspective on the size of the GIS in relation to broader energy and environmental expenditure. Section 3.2 then expands on the types of projects that could be suitable for GIS support, and how these projects might be selected and funded. Section 3.3 discusses the monitoring and evaluation mechanisms that would be required for successful implementation. Section 3.4 looks at the timescales involved, and Section 3.5 goes on to discuss the different types of transaction that might exist between buyer and seller countries.

3.1 Financing GIS

An essential step to be taken when designing the GIS is to determine how many AAUs are realistically available for sale without endangering compliance, and then to decide what portion should go to funding a GIS.

The initial GIS funding would arise from the sale of a portion of the country's assigned amount units. Estimates of the size of such sales can be derived from projections of GHG emissions from the major Annex I players. Taking the reference scenario results from the IEA's World Energy Outlook (IEA 2002a) implies a fairly balanced market, with close to 1000 $MtCO_2$ of demand (shortfall relative to Kyoto targets) for EU, Canada and Japan, and a similar amount of supply (excess allowances beyond Kyoto requirements) for Russia, Ukraine and other EIT countries.

Taking account of additional climate actions that might be undertaken in the buyer countries, WEO's alternative scenario brings the overall level of demand down to around 750 $MtCO_2$. Some commentators suggest that potential buyer countries have greater potential to reduce their own emissions, and that the short-fall may not be so large. Lower estimates are given in the literature, for example Grubb (OECD 2003a) estimates demand based on CO_2 in the range 300-900 $MtCO_2$. A portion of this will be met by CDM (OECD 2003a), reducing the range to around 250-700 $MtCO_2$. Some of this will be transacted between companies, either through JI projects, or via linked domestic / regional emissions trading schemes. However, it is likely that a substantial fraction will be transacted between governments. The price of carbon in these transactions is highly uncertain, and depends on a wide range of factors including actual emissions levels in the buyer and seller countries, the potential use of banking and strategic pricing policies. For illustrative purposes, if we take an allowance price of €5/tCO_2, the total value of transferred AAUs is between €1.25 to 3.5 billion (not including CDM).

By the standards of both energy and environmental expenditure, this represents substantial additional expenditure. For comparison, the total annual environmentally-related expenditure for Russia and Ukraine in 2001 was €4.1 billion and €0.8 billion respectively (OECD-EAP Task Force)[7]. Of the Russian environmentally-related expenditure, €0.8 billion were related to air pollution expenditure. Total environmentally-related commitments by international financial institutions for Russia were €121 million, and environmentally-related ODA commitments were €59 million.

[7] These are approximate estimates, based on self-reported data by enterprises, not all of which could be verified, and should therefore be interpreted with care.

This can be compared to investment requirements for the energy system. The IEA's World Energy Investment Outlook (IEA 2203) indicates an investment requirement for all transition economies of $44 billion per year for the period 2001-2010, of which $27 billion is for Russia. This is of the same order of magnitude as estimates made in the Russian energy strategy, which estimates that the total investment requirements for the energy sector as a whole up to 2020 is around €25-35 billion per year (IEA 2002a).

Compared to the investments required in EIT countries' energy sector therefore, the flow of funds implied by Kyoto trading is in the region of 3-8% of required funds. Given that public finance can usually be used to gear up additional private sector finance by up to 2-3 times through underwriting risks, the proportion of required investments influenced by Kyoto trading funds could increase to 6-24%. In other words, this potential flow of money has the potential to become a significant source of finance in the sector. This raises some important questions for the practicality of the GIS concept.

Firstly, if it were to manage a significant portion of these financial flows, the size of the fund would be very large compared to existing environmental funds. For example, The Polish Ecofund, a debt for environment swap scheme, has annual disposable financial resources in the region of $32m (1995 figure), whilst the World Bank's Prototype Carbon Fund has an agreed funding cap of $180 m. The viability of setting up credible and effective funds orders of magnitude bigger than these established schemes in the relevant timescales would need to be examined before embarking on such a project.

The second issue raised by the size of the financial flows is whether the host countries would be willing to give up control of such a proportion of the investment in a strategic sector such as energy. The GIS structure could imply a fairly strong role of buyer countries in decisions on how the money was spent. For marginal supplementary funding, this might not be contentious, but if the fund is large enough to be the dominant source of finance, this power is likely to be contested.

Tangen et al (2002) suggest that GIS projects should be kept relatively small (preferably less than $1m and not more than $10m), at least in the early stages of the scheme, in order to reduce the time delay associated with organising and financing projects that could deliver real benefits on the necessary timescales. This would require between 1250 and 3500 projects to absorb the full financial flows.

Clearly finding this number of projects would be unmanageable, so either the desire to keep projects to a manageably small size, or the desire to absorb a significant proportion of the total Kyoto financial flows within a GIS structure would have to be sacrificed. The conclusion from these considerations is that there may be real opportunities to use the money for large-scale projects that have a significant impact on EIT countries' energy sector investments, with the substantial caveat that a credible scheme can be established to deal with such large financial flows. Some of the pre-conditions for a successful fund to be established are discussed in Section 3.3.

3.2 Project selection and funding

If successful, GIS will create funds to be invested in climate-friendly projects. How projects are selected and then implemented, will be of great importance for the credibility of the Schemes. GIS could encompass a range of options to reduce GHG, including projects that directly reduce or limit emissions, and projects that indirectly enhance the country's capacity to respond to climate change concerns. Picking up on the conclusions of Section 2, we can identify 4 categories of project that might be suitable for support under GIS.

1. Capacity building and climate policy support activities that strengthen countries' ability to negotiate intelligent targets, and manage emissions down,

2. Small projects that are not well-suited to emissions trading because of the associated transaction costs, but could provide significant savings through wide replication,
3. Advanced technology options that provide large emission reduction potential, and could be strategically important in the future, but are currently too expensive to fund under JI,
4. Under-writing risks associated with emissions trading transactions for standard JI projects.

These are examined in turn in the following sections.

3.2.1 Capacity building and climate policy support

Typically, most countries' domestic climate change strategies include a range of different types of policy which are specifically designed to meet the needs of different sectors of the economy. Within these strategies, the extent of direct government support for individual projects tends to be diminishing. Rather, policies tend to focus on creating favourable conditions for cleaner investment and behaviour, for example by creating appropriate pricing and tax regimes, agreeing/imposing targets and standards with manufacturers and end-users, investing in infrastructure, and supporting the early stages of market development for new technologies. Domestic climate strategies also often aim to integrate environmental policy concerns with other policy goals.

Likewise, for countries with relatively under-developed domestic climate programmes, the scope of GIS could be broadened out to support national programmes more generally, giving a balanced approach across different economic sectors. The advantage of this would be that emissions reductions could be made whilst taking account of national circumstances and priorities. By taking a more strategic approach to funding, this approach could potentially yield greater emissions reductions in the long-run than achieved under a project-by-project approach.

Two key issues arise from broadening out GIS in this way. The first relates to management of the funds – it will be important to ensure that funds are managed in a transparent and accountable way. In general, buyers will want to be sure that the money is being spent wisely, and is making its way into the specified climate programmes. Further discussion on this issue is given in Section 3.3.

The second main issue concerns control of the content of the funded programmes. Buyer countries may want to exert influence over the types of activity that are supported. For example, buyers may not want their funds to be associated with certain activities (e.g. R&D on new technologies, which could undermine competitive positions) or certain technologies (e.g. nuclear programmes could cause a problem for buyer countries that have non-nuclear domestic policies). A compromise position may be established whereby GIS is used to support particular elements of the domestic climate strategy, rather than the whole programme. Such negotiations would need to form part of the bilateral agreements that set up the GIS.

A significant issue in implementing such broad-based climate strategies is the need for sufficient institutional capacity, and these capacity needs are increased even further by the requirements of the international climate negotiations. A legitimate use of the GIS funds could be to build such capacity in the host countries. This would have the advantage of taking out of the equation the complex issue of deciding exactly in which types of activity and technology to invest. Instead, the fund would be laying the foundations for appropriate and sustained responses in the host countries to climate issues (albeit with only indirect impacts on GHG emission reductions).

FCCC/CP/2001/5/Add.1 on a "Framework for capacity building in countries with economies in transition" indicates a range of activities[8] where transition economies may need assistance to implement the Kyoto Protocol, and which might be suitable areas for support under a GIS. These are described in Box 1.

The GEF-UNDP Capacity Development Initiative (CDI) also identifies more generic capacity needs that underpin countries' ability to respond effectively to the climate challenge. For example, there is a need to coordinate more effectively the interactions between individuals and institutions on climate issues, possibly justifying the creation of an institution at central national level to guide activities. This could help to improve communication between policy makers and other stakeholders, and strengthen the process of political dialogue and consensus building, improving the balance of power on environmental issues and improving the effectiveness of external dialogue in the context of multilateral negotiations. There are also systemic barriers to the uptake of improved technologies, both in terms of market barriers due to lack of financial-sector experience, as well as institutional barriers in terms of lack of transparent and effective management of public funds for such projects.

By helping to address institutional capacity gaps that remain a barrier to progress on climate issues in some countries, the GIS could add value and build on existing work in this area (for example under the GEF). It should also be noted that institutional capacity requirements will develop in different ways according to the international framework(s) established post-Kyoto (OECD (2003b)) and any consideration of the use of GIS funds for capacity building should take account of these medium to long term issues.

For countries that do not fulfill the eligibility requirement for trading as set out in the Marrakech accords, funding to allow them to build the required capacity to meet these requirements would probably be amongst the top priority for the host-country. However, in the context of a GIS, these countries will not be in a position to transfer AAUs in advance for such funding. Funding for these types of projects would therefore need to be made available *ex-ante*, before the AAUs are transferred. Such a financial mechanism to make advance payments in exchange for future commitment to transfer of AAUs would therefore need to be incorporated into the design of the GIS for non-eligible countries. Once the host country has achieved eligibility to trade, the full range of projects under the GIS could be undertaken.

Building such eligibility-related capacity also has significant benefits for buyer countries, as it increases the range of countries that can engage in trading, and also gains these countries eligibility to participate in track I JI projects, increasing the buyer countries' opportunities for use of the mechanisms.

[8] Commentaries on the capacity needs in these areas are drawn from the GEF-UNDP work under the Capacity Development Initiative (UNDP 2000).

(a) National greenhouse gas (GHG) inventories. The GEF points to a lack of country specific data for GHG emissions, and the need to create national systems for collecting and verifying data and tracing gaps in statistics. There is also a shortage of suitable experts available to develop and maintain these systems, and some of the information that is collected is difficult to access. A lack of priority is currently given to these activities within the budget allocation process.

(b) **Projections of GHG emissions**. There is a need to develop the necessary individual skills, through training of experts, within a suitable institutional framework following on from the development of improved emissions data and inventories.

(c) **Policies and measures, and the estimation of their effects**. The balance of power is generally not in favour of environmental authorities compared to energy authorities, and polluters' lobbies tend to be strong. At an institutional level, there is a lack of motivation within the administrative apparatus for efficiently managing available funds, and implementing effective climate policies. Policies and measures tend to be dominated by command and control approaches, and there is a need to transfer experience of economic and market instruments, as well as enforcement of policy instruments, supporting capacity at both the institutional and individual level.

(d) **Impact assessment and adaptation**. Access to environmental education is scarce, and capacities in these areas remain relatively low, with needs to build capacity at both an institutional and an individual level.

(e) **Research and systematic observation**. Connected with the needs for additional capacity for policy effectiveness, impact assessments and adaptation.

(f) **Education, training and public awareness**. Low public awareness is linked (both cause and effect) to the problem of environment being low on the political agenda, and there is an opportunity to strengthen the networking among groups concerned with climate change. Targeted training for government officials, NGOs and businesses, as well as facilitating public campaigns should improve the general receptiveness to new climate policies. Provision of formal environmental economics courses could also lead to improved capacities in the longer term.

(g) **Transfer of environmentally sound technologies**. There is a need for a framework that would allow for the creation of self-sustaining and transparent mechanisms and institutional arrangements that would coordinate and implement external aid programmes on technology transfer. There is currently a lack of capacity within financial institutions for the effective implementation of projects, and particularly for small and medium projects in renewable energy and energy efficiency, there remain significant market barriers, requiring intervention in terms of financial support.

(h) **National communications and national climate action plans**. Requirements are similar to those discussed above for a) national inventories, and c) policies and measures.

(i) **National systems for estimation of GHG emissions**. Requirements are similar to those discussed above for a) national inventories.

(j) **Modalities for accounting relating to targets, timetables and national registries**. Requirements are similar to those discussed above for a) national inventories.

(k) **Reporting obligations**. Requirements are similar to those discussed above for a) national inventories.

(l) Joint implementation projects and emissions trading. In many countries, there is a need for improved capacity at both the institutional and individual level for the implementation of JI and emissions trading. This relates to systems for project recognition and approval of projects, development of registries, as well as development of trading strategies within the context of domestic climate programmes.

An approximate estimate of the size of funds that could be put into such activities can be made by looking at funds used to support environmental governance in other countries. The annual budget of the European Environment Agency is around €20m, mostly focussed on data gathering and analysis across Europe. The UK Carbon Trust which coordinates spending on climate change policies at the national level is around €80m per year, whilst the expenditure of the UK Environment Agency on environmental protection (excluding water management) is around €350m per year. The US EPA total budget is $7.7 billion, of which approximately $130m per year is spent on climate change activities. In very approximate terms, this suggests that a broad programme to build data gathering, measurement and reporting, policy implementation and enforcement activities could be of the order of magnitude of €100 m per year for the selling countries region as a whole, although labour cost considerations could bring this figure down.

3.2.2 Small projects

For EITs as a whole, just over 20% of combustion-related CO_2 emissions arise directly from the transport (11%) and household (11%) sectors (compared to 35% for OECD countries). If indirect emissions arising from use of electricity and heat are added to this, the figure rises to 41% of total emissions, with transport representing 12% and residential approximately 29% (compared to 49% for OECD, 27% transport and 21% residential). These end-use sectors should therefore be an important target of emission reduction programmes.

Many studies for EIT countries have shown that the potential for cost-effective emissions reductions in these sectors is high, particularly in residential buildings, where the efficiency of heating and lighting delivery can be low due to lack of investment and proper maintenance[9]. On the other hand, because the emissions savings are distributed over a very large number of end-users, they are difficult to access. Barriers include lack of information and awareness, the landlord-tenant effect[10], lack of access to capital, and often simply lack of time and motivation[11].

Many Annex I countries have found that they need to make special provisions in their climate change programmes to address these sectors, and a range of approaches to accessing emissions reductions from small-scale end-users is probably necessary, including support to generic policy measures as described in the previous section. GIS may in addition be able to address the specific barrier of access to capital for these projects, by providing direct financial support. There are various ways in which such support could be given, for example through setting up loan facilities, or forward purchasing of emissions reductions. In general, funds should be targeted towards least-cost emissions reductions.

Methods do exist to streamline the calculation of emissions reductions from 'standard' energy efficiency projects (e.g. lighting, insulation, heating and appliances). Such methodologies are used for example in the UK's Energy Efficiency Commitment (EEC) scheme administered by the UK energy regulator Ofgem. In this case, the energy suppliers have an obligation to deliver emissions reductions, and are required to prove that investments have been made in a range of energy efficiency options, each of which counts for a certain amount of energy reduction. Expenditure on projects under EEC amounts to around €45m per year over the past 6 years.

[9] See, for instance, Chandler 2000.

[10] This occurs when tenants do not have an incentive to make capital investments in buildings that do not belong to them, and landlords do not have the incentive to invest in energy efficiency for their buildings because they do not pay for the energy bills.

[11] Motivation is often linked to energy prices – in the past prices were too low in EITs to stimulate investment. This situation is reversing as energy prices are brought up to market rates.

In the case of GIS, the approach could be modified so that a central fund provides grants (possibly up to 100%) to cover the investments, the energy suppliers promote and administer the installation of the measures, whilst the energy end-users gain the benefit of reduced energy bills. This could be particularly useful in helping to ameliorate social problems associated with the introduction of full market pricing for energy in EIT countries.

For medium-sized, 'non-standard' projects, for example involving renovations of apartment blocks where a package of measures is taken, projects could bid in emissions reductions from their projects in return for a portion of the fund. Projects could then be prioritised on the basis of least cost per unit of emission reduction. A 'reverse-auction' mechanism not dissimilar to this was used in the UK to allocate funds to companies that bid in emissions reductions relative to a baseline for entry into the UK emissions trading scheme.

In most cases, the effective operation of such schemes implies the involvement of an intermediary between the scheme and the final end-users. This is likely to be the energy supplier, who is in a position to profit from economies of scale in collecting together savings from large numbers of projects. The presence of such a scheme also potentially creates the conditions for competition in the area of energy service provision, as energy savings becomes an additional service.

3.2.3 Advanced technology

Given the scale of the potential funds available, perhaps the most interesting potential use for GIS would be to stimulate a leap-frog in technology investments, by supporting a carbon price at a level which would allow a return on investment for technologies that would not be cost-effective at prevailing international market prices. Funds could be earmarked for certain technologies, allowing for competition from different projects within these technology categories to stimulate cost-effectiveness of emissions reductions.

This approach would have the potential to stimulate significant long-term improvements, particularly for technologies that have competitive operating costs, but which are capital-intensive – the GIS could then help fund the capital expenditure, without the need for on-going subsidies. Examples in the power sector might include renewable generation, advanced coal power generation, or investment in transmission and distribution infrastructure.

There are many other advanced technologies that could be considered (e.g. carbon capture and storage, fuel cells etc), although in general funding from GIS is probably best targeted towards technologies that do not need on-going financial support – i.e. projects that once built, are cost-competitive.

GIS funding could be structured in a number of different ways. Options include:

- **Direct subsidies.** Grants are given to subsidise the capital costs of the advanced technologies. Once the plant is built, it is able to run competitively, and there is no further expectation of payments from the GIS, or returns back to the GIS.

- **Equity for projects.** The GIS funds form part of the core funding for the project, with the GIS taking an equity share, and a corresponding share of the proceeds. Successful projects should generate an income stream for the GIS (albeit at lower than commercial rates, reflecting the higher cost-base for the technologies) which could be recycled into more new projects.

- **Loan facility for projects.** The GIS again forms part of the core project financing, this time in the form of a loan (which could be at preferential conditions compared to commercial loans), with interest payments made back into the GIS.

- **Forward purchase of emissions reductions.** The GIS could make a payment for future emissions reductions resulting from the project. The question of liability for non-delivery of emissions reductions would then have to be solved (i.e. would the GIS or the project developers be responsible for acquiring additional credits should the project fail?). This option implies an on-going commitment for payments, rather than a one-off pump-priming activity.

Again, it will be important to direct funds towards the most cost-effective applications of particular technologies. This can be done by auctioning funds in return for the cheapest emissions reductions within a particular technology category. In order to ensure a fair valuation of emissions reductions, standardised methodologies would be needed, but this is made relatively straight-forward by the fact that comparisons would be made between projects using the same technologies.

Such competition would also ensure that funds are geared up as much as possible. As an illustration, we could consider the hypothetical case that GIS funds were used to provide 100% grants to renewables projects. Assuming capital costs of €1-2 billion per GW capacity, and taking a mid-point estimate of the maximum size of the GIS as €2.4 billion per year, this would give an additional installed capacity of 8 GW over 5 years. This represents less than 4% of total Russian installed capacity. In reality, a greater impact is possible, recognising that once built, the projects will have their own income stream (the size of which depends on the electricity prices), and therefore do not need to be 100% subsidised.

The difficulties of effectively implementing a fund for these types of large-scale projects should not be underestimated however. Financial risks arise in relation to the ability to ensure prudent use of funds on this scale. Consideration of technical risks requires that the technologies are robust to the conditions in which they will be expected to operate – this condition may limit the extent to which 'state-of-the-art' technology can realistically be expected to be deployed.

3.2.4 Underwriting risks

For large projects that generate emissions reductions at a price that is below the prevailing market price for ERUs, there should be sufficient incentive to package these as JI projects. Once the JI mechanism is well established, there should be no need for additional support for such projects. In the short-term however, there might still be barriers to project uptake due to risk factors such as price uncertainty and volatility.

GIS could be used to provide price guarantees that would overcome some of these hurdles. The structure of such support might include:

- **Forward purchase of emissions reductions.** The GIS could make a payment for future emissions reductions resulting from the project. The question of liability for non-delivery of emissions reductions and potential risk-sharing arrangements would then have to be solved (i.e. would the GIS or the project developers be responsible for acquiring additional credits should the project fail?).

- **An option to sell to the GIS at an agreed price.** Project developers should be able to establish more favourable conditions for loans if they are able to remove the carbon price risk element from the project finances. An option to sell provides the project developer with a price floor for the carbon reductions. This option would represent a lower risk for the GIS than forward purchases, since

payments would only be made if the project were successful, and if the option price were higher than the market rate.

The effectiveness of this type of support will depend on the existence of a well-developed banking sector that is able to convert reduced risk into more readily available cash for projects.

3.3 Monitoring, evaluation and governance

The success of the GIS depends on the trust of buyers in the scheme's ability to deliver the intended goals, be they the generation of further reductions or the development of institutional capability to implement and enforce the Kyoto Protocol. Appropriate monitoring of expenditure is an essential element of the GIS. Without proper transparency and accountability for the funds, buyers would probably reconsider their involvement. The types of measures put in place for this monitoring will depend on the type of activity being funded.

In the case of quantifiable projects, the GIS will need to strike a delicate balance between the need for monitoring, verification and review of projects, and the minimisation of transaction costs. Tangen et al. (2002) mention that the GIS could be attractive as a way to bypass the lengthy and costly JI approval cycle, including the difficult task of defining a baseline. The question is whether simplification will not be made at the expense of projects' environmental integrity.

In practice, the costs of the JI approval cycle may not be so onerous, depending on whether the country is eligible to trade under the Marrakech Accords requirements. The eligibility requirements specify that Parties that have ratified the Kyoto Protocol should have in place national systems for estimation of emissions and sinks of greenhouse gases, inventory systems for recording these, and that it is in compliance with the procedures for reporting of these emissions, sinks and assigned amounts. Countries that are in compliance with these requirements will be given a well-defined allocation of AAUs. Under a JI transaction, transferred ERUs will be deducted from the country's total allocation of AAUs. This type of JI project, called Track I JI, is effectively a zero-sum game, since no additional emissions allowances are generated. In these cases, it will be up to the host country to determine a suitable regime for checking the eligibility of projects for ERU transactions. Such monitoring regimes would not necessarily be too onerous, and in these cases, the need for a separate GIS mechanism is questionable.

Parties that do not meet the Marrakech eligibility rules for trading can engage in Track II JI whereby baselines and emissions reductions are certified by independent verifiers, and all projects would be submitted to the JI supervisory committee (FCCC/CP/2001/13/Add.2). But since these parties would not be eligible to sell AAUs, a GIS as proposed would not be applicable, so could not be used to avoid the more burdensome Track II project cycle.

The GIS should make it possible for a broad range of domestic actors to access its funding, with clear guidelines (e.g. on costing) and criteria to facilitate project selection and review by observers, if needed. Buyers interested in acquiring emission reductions from projects could also be consulted at the selection stage. Once selection is made, an indication of expected reductions should be made public to facilitate the review by observers as the project starts operations. This would be one way to ensure that funding has been adequately spent[12].

[12] Note that to be financially transparent on the contribution of its buyers, the GIS may eventually reveal the price at which AAUs are transferred. The total contribution of any government or entity to the GIS, made public in the Scheme financial statement, divided by the transferred AAUs information accessible via the registry) would give a good indication of the price of a GIS transaction.

Non-quantifiable projects have a different set of problems with regards to monitoring, and it is appropriate to draw on experience of management of other large public funds in this regard. The OECD Task Force for Implementation of the Environmental Action Programme for Central and Eastern Europe (OECD EAP Task Force (b)) has produced a guide to 'good practices of public environmental expenditure management in transition economies' that has some relevance in this regard. These guidelines identify three main categories that need to be fulfilled to ensure good practice, outlined in the table below.

1. Environmental effectiveness	• Additionality and consistency with other environmental policy instruments • Sound and well-defined programming framework • Sound and documentable consideration of environmental effects • Maximising environmental effect from available funds • Leveraging additional private and foreign finance for the environment
2. Fiscal prudence	• Fiscal integrity of revenue • Negative efficiency impacts of earmarking are minimised • High standards of fiscal discipline and transparency • Accountability and transparency • Collection of revenues and public procurement separated from expenditure management
3. Management efficiency	• Sound governance • Professional executive management • Sound project cycle management • Fair and unbiased relations with external stakeholders • Effective management of financial products and related risks

In general, good governance is fundamental to the success of any public fund, and whatever the operational details, a GIS would have to incorporate appropriate structures to ensure transparency and accountability in the management of the funds.

Credible fund management will typically comprise three levels. At the top level, a supervisory council sets criteria for expenditure, prioritises activities, and approves annual budgets and plans. This is the level at which ultimately liability for the performance of the scheme rests, and it is at this board level that buyer

countries would be represented[13], although buyers may choose to adopt more of a hands-off attitude, leaving it to external auditors and certifiers to guarantee the GIS's integrity, particularly if they are only investing relatively small amounts in a particular country. Below this, a board of directors, comprising technical, financial and other operational divisions, would manage the revenue and expenditure process, developing the work programme and packages of projects for approval by the supervisory board. At the operational level, there would be a team responsible for managing the project cycle, ensuring that projects met the eligibility and appraisal criteria, and monitoring the projects from a technical and financial angle, both during and after implementation.

The key purpose for introducing such structures is to ensure that the right projects are selected, that the designated money is actually spent on these projects, and that the projects are fully implemented. Whether the scheme is managed within or outside of existing Government bodies, the institutional structure should be given managerial independence and autonomy to avoid political influences affecting the choices of investment. Experience from management of other environmental funds suggests that defining liability is crucial. This can be summarised by asking the following three questions: who is responsible, what they are responsible for, and to whom are they accountable. A review of the Moldovan national environmental fund (OECD 2002) found that it was exactly in the areas of transparency, accountability, establishing priorities and improving the project cycle management that improvements needed to be made. These concerns should be factored into the initial design of any new fund such as a GIS.

3.4 Timeframe for GIS

The primary driver for creating green investment schemes is for buyers to promote the environmental effectiveness of an emissions trading transaction. How long will this driver last for? In the first instance, it is the excess number of AAUs available for the first Kyoto commitment period which is causing the concerns. Although there is considerable uncertainty about how the negotiations for any post-Kyoto regime will play out, it is probable that the issue of 'hot-air' will be diminished in the future. Two options therefore present themselves:

- GIS may be a short-term phenomenon, being set up to provide a focus for channelling funds arising from sales mainly in the first commitment period, with operation of GIS being driven mainly by buyers interests. This interest diminishes after the first commitment period because environmental efficacy issues are incorporated into the new post-Kyoto agreements. This model implies that immediate actions to develop a GIS would need to focus on rapidly setting up the infrastructure for identifying and providing support for suitable (probably short-term) projects.

- Alternatively, GIS may be viewed as forming part of the longer-term structure of host countries' domestic climate activities. Funds generated from sales of AAUs in the first commitment period are combined with other sources of domestic funding for the climate programme, and are committed over a longer period of time. Revenues from project investments and further AAU sales resulting from the additional emissions reductions are recycled back into the fund to generate some rolling funding. Buyers' involvement in the GIS is more indirect, so falling levels of buyers' interest in the GIS would not necessarily have a big financial impact on the programme.

[13] This is the structure implemented in the Ecofund debt-for-environment swap in Poland, whose principal revenue source, unlike traditional environment funds in EITs, is debt swaps agreed with Paris Club creditors. The representation of the creditor countries in these situations is seen as important for the accountability of the scheme.

3.5 GIS transactions between buyer and seller countries

In its simplest form, the GIS is simply a domestic policy that sits within the framework of the host country's climate strategy. The scheme is publicly established, with AAUs available for sale, and projects are financed through revenues from such sales. So long as there is sufficient transparency and accountability in the management of the funds, the buyer is confident that its purchase is not a straight "hot air" acquisition, but has not created a special link with the GIS either. This type of arrangement is fully compatible with the Kyoto Protocol rules; once AAUs have been transferred from the seller's to the buyer's registry, buyers are not bound in any way to the seller.

On the other hand, GIS could suggest a slightly different logic: buyers may take a more proactive interest in how the money is spent, in order to help establish the environmental credibility of an emissions trading transaction. Buyers will have made a public commitment to finance a fund created to promote further reductions in the selling country. For this reason, buyers may wish to be involved in the assessment of this system.

Different transaction structures might then be applied, the choice of which would reflect the various priorities and attitudes to risk (project and environmental) of the buying and selling parties.

- As discussed above, the simplest form of transaction would involve a transfer of AAUs, with the buying party having no further claim on the emissions reductions that might result from re-investment of these funds (similar to early crediting).

- Countries that do not meet the eligibility requirements for trading set out in the Marrakech Accords may want to attract finances in order to fund the necessary capacity building to meet these requirements. Since they cannot immediately transfer AAUs in exchange for such funding, a different type of financial transaction would be required, such as an option or a futures-type instrument. Such a transaction would need to include the relevant risk-management (e.g. of non delivery etc) arrangement between the buyer and seller parties.

- Alternatively, a buyer may want to acquire emission reductions made possible by its initial contribution to the GIS. The acquisition of AAUs via GIS would grant rights that are similar to those of participants in the Prototype Carbon Fund, with the difference that the buyer would also receive AAUs in the beginning. Such an arrangement requires that the buyer's rights be clearly defined and restricted (for example, rights limited to a first generation of emission reductions). Its acquisition of project-based reductions should not grant it further rights to other reductions generated by the GIS, otherwise there would be a cascading effect, whereby initial contributors to the GIS would have exclusive rights to all new reductions.

- The buyer could also decide to have an *option* on the purchase of future reductions (i.e. the right but not the obligation to buy these reductions at a pre-agreed price).

- Buying countries may wish to set up transactions whereby the AAU transfer may be cancelled if the intended projects are not successful[14]. This would effectively remove the project risks from the buyer's side.

These different transaction structures represent different levels of engagement of buyer countries in the operation of GIS, and would have to be incorporated into the bilateral discussions between buyer and seller countries.

[14] Escrow accounts could be used to that effect, although this would deprive the GIS from the intended funding.

4. Conclusions

This paper overviews some of the key considerations in the design and implementation of Green Investment Schemes (GIS) as a way of encouraging the use for environmental purposes of financial flows associated with emissions trading in the Kyoto Protocol. The aim of the paper is to investigate where the real value of such a fund might lie, so as to inform future discussions on this issue.

Principle conclusions from the paper are:

1. For projects which can generate emissions reductions at below the prevailing international carbon price, JI and domestic emissions trading provide mechanisms that are well designed to bring such investments forward. Any GIS should be designed so that it enhances the effective operation of these mechanisms.

2. The maximum size of the financial flows linked to excess AAU transactions is expected to be approximately in the range €1.25 to 3.5 billion per year (not including CDM). This is significantly higher than existing environmental funds, and represents between 3-8% of total projected annual investment requirements in the energy sectors of EIT countries. There is thus significant potential for funds to be used to stimulate additional improvements beyond what would be achieved otherwise. Four likely candidates. include:

   - Firstly, one of the key areas where GIS could provide valuable new sources of funding is the strengthening of institutions and other capacity building activities to support GHG measuring, reporting, and general support for climate mitigation policies. This could strengthen the Kyoto process by reducing uncertainty, helping countries to set intelligent targets, improving their ability to effectively manage emissions down, and setting up the infrastructure to support JI and emissions trading mechanisms. Since this would only indirectly influence emissions, this type of project could be seen as a good way of 'absorbing' surplus allowances, although the total amount of expenditure on these types of activity are likely to be small compared to the total value of Kyoto transactions, and a possible disadvantage from the buyers perspective is the lack of visibility of such projects with respect to reducing climate impacts.

   - Secondly, the fund could be used to promote specific technologies (e.g. renewables, advanced coal technologies, carbon sequestration etc) that would not otherwise be cost-effective and would not normally be stimulated by the emissions trading/JI market. This could lead to a technological 'leap-frog' effect, which might have significant co-benefits in terms of meeting energy security policy goals as well as environmental goals. This might be particularly suitable for technologies that have competitive operating costs, but which are capital-intensive – the GIS could then help fund the capital expenditure, without the need for on-going subsidies. Such funding could potentially represent a large proportion of the Kyoto transaction finances.

   - Thirdly, recognising that some significant parts of the energy system are not well suited to directly accessing international emissions trading markets, there could be benefit in providing a mechanism that allows bundling of emissions savings from groups of smaller projects. GIS could fulfil this role by acting as a central fund for financing such projects, for example in the transport, households and small business sectors. Assuming that such projects would be kept small in order to be manageable and deliver savings over the required timescales, the proportion of total Kyoto transaction finances going through the GIS to fund these types of activity might be relatively small.

- Fourthly, GIS funds could be used to offset some of the risks associated with uncertainty and volatility in carbon prices that might adversely affect the investment climate for JI projects, and reduce the extent of emissions reductions achieved.

3. If a GIS scheme is introduced, the fundamental issue to get right is governance of the scheme. Ensuring that the funds are managed in a transparent way, with full accountability of fund managers, is essential to the scheme's success.

4. The GIS could either be designed to fulfil a function only for the first Kyoto commitment period, or the money could be invested in direct emissions reductions projects that would be expected to make a return on investment back into the fund. This would provide ongoing revenues, and effectively use the Kyoto 'windfall' to fund continuing improvements in future decades. Where subsidies are concerned, good-practice dictates that such schemes should be time-limited in order to ensure the funds act as a pump-priming rather than creating financial dependence.

In summary, the paper concludes that there is significant potential to use the revenues from international transfers of AAUs for investments that would both achieve real environmental benefits, whilst also helping achieve other strategic objectives for energy sector investments. Through investing in capacity building activities, a GIS could also help to strengthen the overall climate negotiations by reducing uncertainty, and improving countries' abilities to manage emissions down. A GIS could help buyer countries justify emissions trading to domestic stakeholders, whilst for seller countries it could in turn help to free up the benefits of the Kyoto regime, and provide an additional incentive for Kyoto ratification.

The expected benefits of a GIS will only accrue if the funds can be managed in a transparent and accountable way – poor governance would undermine environmental and economic benefits, as well as confidence in the scheme which could drive away potential investors. The fact that GIS schemes will be set up, operated and overseen predominantly by the seller countries themselves, emphasises the need for transparency and accountability in the project management cycle and decision making processes.

One of the unresolved issues for GIS is that it suffers from the same problem associated with earmarked funds in general, namely that they divert mainstream expenditure within the domestic budgetary process. This points to the GIS as being a short to medium-term rather than a long-term solution, although clearly, the role that GIS plays in the longer term will depend on any post-Kyoto deal. In the longer term, it may be better to find other ways of dealing with the issues of surplus allowances within the framework of the international climate negotiations, rather than in a separate mechanism.

Notwithstanding these caveats, the current political realities point to the need for a short-term solution to the existing surplus allowances held by EIT countries, and this paper points to several areas where GIS may be able to fill short term policy and funding gaps.

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