

Green Investment Schemes:

Maximizing their benefits for climate and society

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Abbreviations

| | |
|-------------------|---|
| AAU | Assigned Amount Unit |
| CCFI | Climate Change Financing Instrument |
| CDM | Clean Development Mechanism |
| CEE | Central and Eastern Europe |
| CER | Certified Emission Reduction |
| CO ₂ e | Carbon dioxide equivalent |
| COP | Conference of the parties |
| CP | Commitment Period |
| CPA | CDM program activities |
| EB | Executive Board |
| EE | Energy efficiency |
| EIT | Economy in transition |
| EPBD | EU Directive on Energy Performance of Buildings |
| ERU | Emission reduction unit |
| ETS | Emission trading system |
| EUA | European Union emission allowance |
| FM | Flexible mechanism |
| GHG | Greenhouse gas |
| GIS | Green Investment Scheme |
| IET | International emissions trading |
| JI | Joint Implementation |
| KP | Kyoto Protocol |
| LULUCF | Land use, land-use change and forestry |
| MOP | Meeting of the parties |
| MOU | Memorandum of understanding |
| MRV | Monitoring, reporting and verification |
| Mt | Million tons |
| PoA | Program of activities |
| pCDM | Programmatic CDM |
| S-CDM | Sectoral CDM |
| SSC | Small scale CDM |
| UNFCCC | United Nations Framework Convention on Climate Change |

Executive Summary

Green Investment Schemes (GIS) are a new carbon finance mechanism that complements presently existing ones in Central and Eastern Europe (CEE). GIS could serve as an alternative mechanism for funding projects and programmes that other international instruments (such as Joint Implementation) have not been able to deliver, and as a testing ground for the development of future flexible mechanisms for mitigating global climate change. But the window of opportunity is closing fast: architectural design, legal framework, negotiations, completed transactions, revenue disbursed and subsequent investments, all have to be completed by 2012.

Green Investment Schemes have been introduced to enhance the climate effectiveness of International Emission Trading (IET), a system undermined by the excessive number of Assigned Amount Units (AAUs) allocated to former communist countries in the first round of Kyoto commitments. GIS is thus a “hybrid” of two mechanisms: IET of the AAUs as defined by the KP’s Article 17, plus greening activities using the revenue from their sale. Whilst IET is regulated by the Kyoto Protocol, the Marrakesh Accords and the COP/MOP decisions, domestic greening activities are not covered by international regulation.

Development in GIS has been extremely rapid during the past 2-3 years, progressing from initial consideration to completion of the first transactions in the autumn of 2008. In June 2007, the Hungarian parliament approved the pioneer national law on GIS implementation and had secondary legislation in place by the end of 2007. As of October 2008, Latvia had established the legal framework and institutional system, the Czech Republic, Ukraine and Romania have adopted general legislation on GIS, and Bulgaria and Poland have demonstrated strong interest in the scheme. Hungary also announced the first two AAU transactions with Belgium and Spain for the sale of 8 million AAUs in total, jump-starting competition among CEE countries. Ukrainian and Romanian officials expect their first AAU deals to take place by the end of 2008 or early 2009.

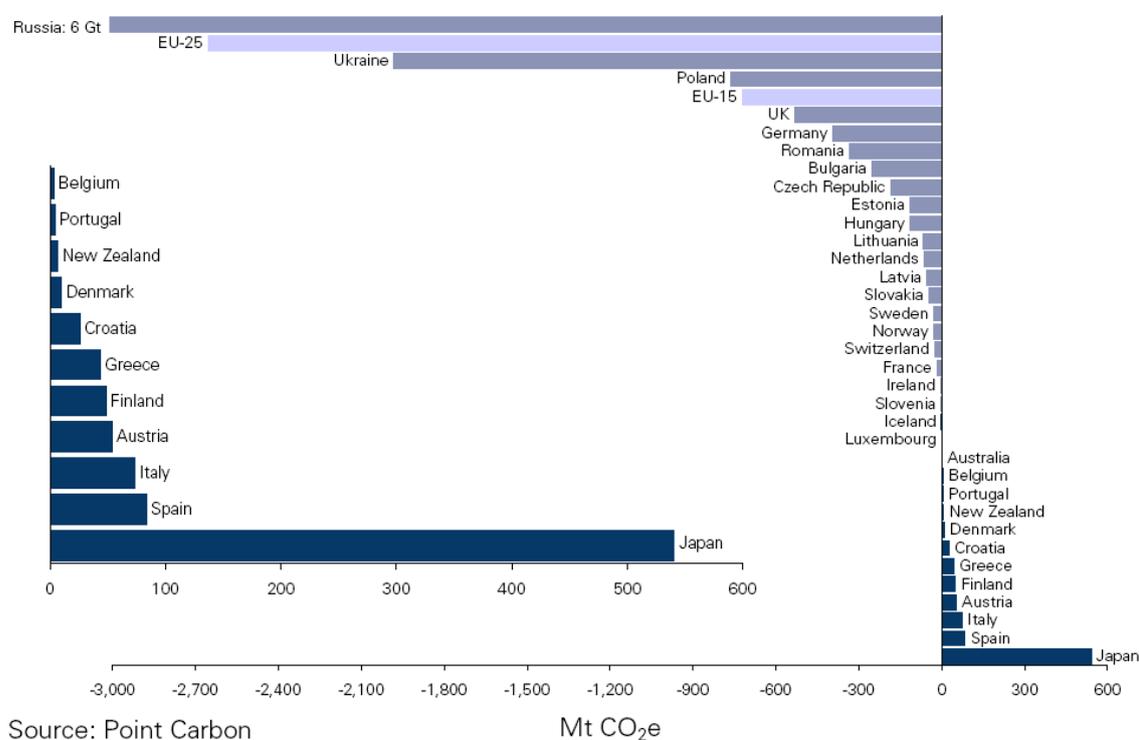
From a legal perspective, GIS is a self-imposed, binding commitment by potential seller countries to fulfill conditions set by potential buyers. As there is no international regulation on GIS, countries have great flexibility in drawing up their schemes. This offers major new opportunities: it could potentially “correct” the shortcomings of other carbon finance mechanisms. However, this flexibility also poses significant risks: environmental integrity is harder to assure without robust international legal and institutional frameworks. The

purpose of this report, therefore, was to investigate how this flexibility can be best utilized for maximizing GIS's benefits to climate and society, whilst ensuring that environmental integrity is not compromised at the expense of simplicity and flexibility. This purpose is reached through two main processes: an investigation of the shortcomings of existing carbon finance mechanisms (mainly JI and CDM) and drawing lessons on how GIS could overcome them, and applying these lessons and other criteria to an investigation of how such schemes can be designed to ensure environmental integrity and to maximize benefits for the climate in the long-term.

Due to a very short window of opportunity, as well as lessons that could be learned for future climate regimes and carbon mechanisms, it is essential to understand the potential implications of various decisions related to the design of a GIS. So far, the body of research and preparatory work on GIS is dwarfed by that on other carbon mechanisms. Because of the significant risks and opportunities resulting from a lack of international regulation, cooperation and careful planning are required to unlock the real benefits for the climate and for societies in both selling and buying countries.

The overall potentially available AAUs from Central and Eastern-European (CEE) countries, together with Russia and Ukraine, are app. 6.5 Gt over the first commitment period, whilst net demand is estimated at 900 Mt, as illustrated in Figure 1.

Figure 1. Net demand and supply, after taking into account sink provisions under Annex Z in the Kyoto Protocol, planned purchases of CERs and ERUs, and domestic reduction measures such as direct control regulations and the EU ETS.



If demand of 900 Mt was met through AAU purchase at €10/ton (which is lower than the price of transactions completed before the current financial crisis developed) the expected value of AAU transactions could be in the range of €9 billion. Table 1 shows estimated amounts of AAU supply through GIS by major selling countries and the potentially achievable respective GIS revenues, assuming an AAU price of €10.

Table 1. GIS-based AAU supply by major selling countries during first commitment period and the potential respective revenues (estimates by Point Carbon, 2008, unless otherwise indicated)

| Country | Czech Rep. | Hungary | Latvia | Poland | Romania | Russia | Ukraine |
|-----------------------|------------|---------|--------|-----------|-----------|--------|-----------------------|
| MtCO ₂ -eq | up to 100 | 50 | 30 | up to 100 | up to 100 | 0 | 100-1200 ² |
| Billion EUR | up to 1 | 0.5 | 0.3 | up to 1 | up to 1 | 0 | 1 - 12 |

Based on a review of GIS developments in the region, as of October 2008, Hungary and Latvia are the GIS front-runners. However, the situation has been

² Estimate by The Carbon Trust

changing dynamically over the past few years, and hesitant countries may still generate sudden progress. It seems likely that the GIS/AAU market will grow at a modest pace and, at least for the next couple of years, will constitute a relatively small share of the global carbon market, being characterized by low liquidity and hampered by institutional constraints. Nevertheless, it is still an important market for the sellers. For instance, total EU investment into AAUs is likely to run in the order of € 3.8-4.0 billion, and the EU might consider the adoption of guidelines that preference the purchasing of AAUs from another member state instead of non member states. If these funds are invested in climate mitigation in other EU member states, this will help the EU to comply with its post-2012 commitments³, thus avoiding significant investment in the next commitment period.

Revenues received by the selling countries could dwarf most other funds or budget items devoted to climate change mitigation or sustainable energy promotion. This represents a unique opportunity to address key climate change mitigation priorities that could not, or only with difficulty, be financed through other carbon market mechanisms.

This fact, combined with other characteristics of first generation GIS, influences the choice of priority target areas for GIS spending. First generation GIS is likely to be a unique source of carbon finance, not likely to continue after 2012, and at the same time, there is likely to be a significant oversupply of (greened) AAUs on the market. In addition, due to environmental integrity concerns, monitoring and verification of emissions reductions are important for most types of GIS. Finally, the window of opportunity is very short for disbursing and effectively investing these funds.

In determining priority target areas, a guarantee of environmental and climate integrity must be pivotal, followed by maximization of climate benefits. Environmental integrity is assured through the additionality of investments; maximizing gains for national social, political and regional development priorities can be achieved through a careful choice of target areas. Due to this unique window of opportunity, the report argues that it is important to channel the funds towards greenhouse gas (GHG) reduction needs that are difficult to foster by business-as-usual policies or available/foreseeable support schemes, and that satisfying additionality should be a key criterion for target area selection and modality design. This is especially important in EU member states, or other countries with ambitious GHG reduction targets, where many policies and mechanisms are already in place. In addition, it is important to ensure the practical feasibility, dispensability and transaction costs of the given GIS model in the chosen target sector, as well as transparency and accountability in operation.

³ Assuming that mitigation-related investments will be in long-lifetime projects, such as infrastructure or other long-lifetime capital stock.

Since GIS revenues represent a potentially significant opportunity for mitigation finance – and potentially a one-off opportunity for some CEE countries, this report argues that it is advisable to direct this to GHG reduction priorities that are important but cannot easily be tackled by other means in the near future, rather than towards lowest-cost measures. Such areas include low-carbon infrastructure that determines emissions in the long term but is difficult to finance through other mechanisms, and where emission reduction monitoring and verification are feasible. In addition, if political, social and development gains are considered as key factors of selection, societal benefits from the utilization of GIS revenues will be maximized.

The report identifies the low-energy retrofit of old, inefficient building stock as a high priority target area that is associated with especially important and numerous co-benefits, e. g. health and comfort improvements, an increase in social welfare and a reduction of fuel poverty, employment creation and new business opportunities, higher energy security, increased value for real estate, and reduced social pressures from energy tariff increases. Within this particular target area it is pivotal that GIS spurs investments to *very low energy* construction and retrofit, potentially nearing passive solar standard levels. This is because the lifetime of the building stock is one of the longest of all carbon-related capital stock, and suboptimal retrofits not only lock these buildings into a GHG-wasting future for many decades to come, but also make subsequent later efficiency retrofits prohibitively expensive due to eroded future savings with comparably high costs. Other priority areas identified by the report are biomass-based heating, with due consideration of its potential impact on local air quality, as well as land-use activities in certain countries such as Russia, Ukraine, Romania, Bulgaria and Poland. Land-use projects may create significant co-benefits, such as income creation for the rural population, increased biodiversity, avoidance of forest fires, and in some cases, synergies with adaptation, for example when carrying out afforestation in areas where climate change increases the risk of erosion or droughts.

Assessment of the experience of Joint Implementation (JI) and Clean Development Mechanism (CDM) reveals a few important lessons. Firstly, they have largely failed to deliver in those mitigation areas with the highest sustainability benefits which are also especially important priority areas in CEE, such as building energy efficiency, small- and medium-scale bioenergy utilisation. Because of this, the study concluded that it would be detrimental for GIS to “copy-paste” CDM/JI⁴ architectures in its modality design. The report found that while ensuring additionality (e.g. through monitoring and verification) is fundamental for the environmental and financial integrity of GIS, applying simpler approaches to M&V and additionality enforcement than in

⁴ Track 2

CDM is essential. Whilst the model of programmatic CDM may be partially applied, it is important that some restrictions of pCDM are not transferred, such as limiting a programme to one type of emission reduction. This can make energy efficiency (EE) projects impossible as most of them involve multiple procedures or multiple projects.

The study analysed the different modalities of GIS architectures and their impact on climate effectiveness: selected recommendations are summarized in Table 2.

The following paragraphs highlight a few recommendations that have particular importance for climate effectiveness.

First, in order to ensure environmental integrity through additionality, but avoiding the pitfalls of CDM, simpler and innovative approaches are needed, e.g. the Hungarian GIS is set up in a way that provides finance only for investment types that would not take place in its absence but are important for the climate; building retrofits are supported to efficiency levels that are not attractive under other financing schemes but that lay the foundations of a low-carbon building stock.

On the other hand, *lenience towards additionality* by many host countries is a worrying trend. So far no CEE GIS legislation ensures that revenues are spent on investment that is additional (although EU member states are subject to certain additionality requirements by EU law, these are insufficient to ensure climate additionality). Some countries even announced that additionality is not an important criterion in their GIS. Such trends raise significant environmental concerns about the system.

Since priority GIS target areas typically have long payback times, it is crucial that the combination of allowable crediting period, greening ratio and AAU sales price ensures adequate bankability for long-term projects. If the crediting period does not account for emission reductions earned beyond the end of the first commitment period, and a strict 1:1 (or close) greening ratio is required, with current ranges of AAU prices, investment types will be severely limited to very low hanging fruits – that is investment already taking place through JI or other policies/mechanisms. Therefore, a realistic post-2012 crediting period (say up to 2020) is important for accommodating investments that determine long-term emissions and that would not take place without GIS.

In addition to the crediting period, one other important time-frame decision remains. If greening activities cover more complex areas than other mechanisms of carbon finance, fund disbursement and administration can present serious bottle-necks for the magnitude and effectiveness of GIS schemes in general. This is compounded by the challenge of initiating and

starting up a new scheme and financing mechanism that require time to reach full-volume operation. This means that if all aspects of GIS need to be completed by the end of the first commitment period, i.e. including the disbursement of revenues, this substantially elevates the risk that the revenues cannot be spent in an otherwise optimal way. Therefore, it would be important to allow post-2012 disbursement with necessary safeguards for fund management.

The report concluded that GIS, if well designed and operated, can offer significant advantages over JI in many applications. GIS accommodates longer-term horizons and allows governments to place emphasis on areas where early investment is crucial for the transition to a de-carbonized economy in the long-term. In addition, GIS offers an opportunity for implementing small projects, such as those involving buildings. Whilst programmatic approaches can also be implemented under JI, it is unlikely that they will play a role in CEE countries, as JI is developed by the private sector which has little incentive to carry out complex project types whilst there are simpler ones available. Finally, GIS has specific advantages for land-use projects since CDM and JI restrict eligible land-use project types, whilst under a GIS any land-use activity is potentially eligible.

The report also conducted in-depth GIS case studies on energy efficiency in Hungary's building sector, on biomass in Bulgaria and land-use in Romania, and found that it could play a major role in greenhouse gas reduction, over and above that achieved by existing instruments. A special strength of GIS is flexibility regarding project types and implementation.

Finally, the significance of GIS runs beyond the first commitment period. If the experiences prove to be positive, GIS could become the model for a superior carbon finance mechanism, or for one that fills important carbon market niches. Its experiences could be directly transferred or indirectly utilized in post-2012 flexibility mechanisms, used as a model to finance climate activities in developing countries, or for disbursing climate funds, such as the auctioning revenues from EU ETS.

Table 2. Summary recommendations for GIS architecture design modalities, in order to optimize their impacts for climate and society

| Modality category | Issues in modality choice and recommended modality where applicable |
|-------------------------------|--|
| Greening option | Dominance of hard greening is required to ensure climate effectiveness. A small share of soft greening can be important to facilitate the effectiveness of the hard greening part, but this should be a minor share to avoid potential risk of misuse, since ensuring the integrity and effectiveness of spending through soft greening is difficult. |
| Programmatic/project approach | A purely project-based approach may compromise GIS in areas where small and dispersed investments are needed such as end-use efficiency or small-scale renewables, because of transaction costs. A programme-based approach has lower transaction costs and can have larger scale roll-out. |
| Budgetary option of the fund | Due to relatively low financial discipline and major budgetary problems in CEE host countries, it is important that revenues enter special accounts from which money can't be legally paid for other uses. |
| Additionality requirements | Additionality is essential for ensuring the environmental integrity of GIS: financial, legal and environmental. Some financial additionality is mandated for EU member states but not enough to ensure environmental integrity. Additionality should ideally be stipulated in GIS legislation, but must at least be ensured by the scheme setup. Rigorous quantitative additionality enforcement, on the other hand, may be counterproductive for many areas of high priority for GIS in CEE. |
| Baseline | Sectoral baselines rather than individual baselines substantially reduce transaction costs and can overcome methodology problems. |
| Monitoring and verification | M&V are essential for ensuring environmental integrity. They are a crucial supervision tool and the proof of the projects taking place as agreed between the buyer and seller. However, rigorous M&V as in CDM, could kill GIS in important priority target areas. Simplified, innovative M&V methods are suggested, such as calculations confirmed by random checks, using ISO standards, etc. |
| Crediting period | Allowing post-2012 crediting is important in order to avoid GIS picking only the low-hanging fruit. If, however, flexibility is applied to the greening ratio, or AAU prices are high, or substantial co-funding is applied, long-term investments may still be bankable. |
| Timeframe | Normally transactions will be allowed only in the 1 st commitment period. However, extending the timeframe for funds disbursement would be important for optimizing climate effectiveness. The remaining time is too short for a careful scale-up of funding schemes, and disbursement capacity will either be a serious bottleneck limiting the total volume of GIS, or the climate effectiveness will be jeopardised if funds are spent compromising the optimal framework in order to expedite disbursement. |
| Greening ratio | 1:1 ratio would be ideal, but may not be feasible (too narrow circle of enabled investments) if the crediting period does not extend beyond 2012 or if there is no co-financing. |
| Priority areas targeted | Due to the one-off window of opportunity, high-priority climate abatement areas not easily targeted by business-as-usual activities and policies are ideal target areas. These often include low-energy infrastructure determining long-term emissions but typically associated with long payback times (buildings, transport). Societal co-benefits for host countries can also be maximized. In particular, in the CEE, attractive areas that fall into these categories include: energy efficiency in residential and public sectors; renewable energy for heating; biogas production for transportation purposes; other small-scale bioenergy investments; LULUCF if applicable in host country. |

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1 Introduction

1.1 Background

The Green Investment Schemes (GIS) have been introduced to address conditions for selling the surplus Assigned Amount of Units (AAUs) for Kyoto parties with quantifiable emission reduction targets. International Emissions Trading (IET) is one of the emerging carbon finance mechanisms which is emerging in the region of the former communist bloc. The former centrally planned economies, i.e. the Central and Eastern-European (CEE) countries, together with Russia and Ukraine have app. 57.8 billion surplus AAUs (Point Carbon 2008b) for the first Kyoto commitment period between 2008 and 2012. This is often referred to as “hot air”, as there is a common connotation that a major share of these emission rights (AAUs) have not been gained through planned emission reduction efforts, although some of this drop in emissions was due to the improvements in carbon intensity directly or indirectly resulting from energy-related measures, such as lifting subsidies, drastic tariff increases, international and national funds invested into the improvement of energy efficiency or improved operational efficiency after changing corporate operational principles from central planning to profit-orientation.

In principle, these emission rights can be sold under Article 17 of the Kyoto Protocol, to Annex-I countries that are not able to comply with their targets. Article 17 of the Kyoto Protocol sets out the principles of IET, i.e. who and under which conditions can participate in the IET, as briefly described in Annex 1. The most likely sellers under the KP's IET scheme are the countries (or their authorized entities) that have surplus AAUs during the 2008-2012 period (such as Russia and CEE region). The most likely buyers are the countries (or their authorized entities) that will not be able to meet their Kyoto targets without major domestic efforts (such as Japan and some of the EU15 countries).

However, most of the potential buying countries, such as the majority of the EU-15 and Japan, have already expressed that they do not intend to achieve their compliance with the Kyoto Protocol through buying “hot air”, i.e. by purchasing surplus AAUs that are not the result of real emission reduction activities (Gorina, 2006; Carbon Finance at the World Bank, 2006). Since AAU buying countries will spend taxpayers' money on purchasing allowances from other countries, it is important that they are able to demonstrate to their parliaments and concerned voters that by the purchase of AAUs (to comply with their own country specific Kyoto target), a real contribution has been made

to the long-term mitigation of the climate change problem⁵, or at least for environmental improvements, similarly to the earlier ideas of debt for environment swaps.

In order to bridge this gap, GIS was proposed to unlock the surplus AAUs in the region for Annex I compliance, and to leverage the potential financial revenues from such sales for climate benefits in CEE countries (Tangen et al, 2002; Blyth and Baron, 2003). GISs tie greenhouse gas (GHG) emission reductions to the sale of AAUs, therefore “greening hot air”. The basic principle of Green Investment Schemes in connection with the KP’s Article 17 trade of AAUs is that the revenues from surplus AAU sales are invested into “greening” activities in a manner that is acceptable for both the selling and buying governments. Although in principle there is no international rule that GIS revenues need to be spent on climate-related activities, and some sellers have been proposing non-climate greening activities, the greening activities will be confined to limited non-climate spending from AAU purchases due to pressures from taxpayers in some of the buying countries. This maybe a less strong criterion for some non-governmental buyers: for instance, several Japanese buyers consider accepting a mixture of greening that contains non-climate-related “greening” in exchange for a lower purchase price.

From a legal perspective, GIS is a self-imposed binding commitment by the potential seller countries, to fulfill the conditions of the potential buyers, i.e. to achieve greenhouse gas (GHG) emission reductions or environmental improvements from the purchase price of the AAUs, therefore meeting the condition of the buyer, to “green hot air”. As there is no international requirement on how to model the GIS (only a reference to GIS in the UNFCCC Decision 10/CMP.2, which inter alia welcomes that Belarus will use any revenues generated from transfer under Art. 17 for further greenhouse gas emission abatement measures), countries have great flexibility in drawing up their schemes.

This substantial flexibility, especially as compared to the other KP flexible mechanisms, offers major new opportunities: it could potentially “correct” the shortcomings of other carbon finance mechanisms. However, this flexibility also poses significant risks: environmental integrity is harder to assure without the robust international legal and institutional frameworks designed for this purpose. The purpose of this report is to investigate how this flexibility can be best utilized for maximizing GIS’s benefits to climate and society, but also to ensure that environmental integrity is not compromised at the expense of its simplicity and flexibility.

⁵ In principle adaptation activities are also possible within GIS schemes, along with any other environmental activities. However, since the funds from the buying countries were aimed at complying with the emission reduction targets of the KP, it is likely that this is the area where the citizenry and the governments of the buyers will want these funds to be spent on.

GIS could play a major role on the carbon market, as well as in providing a new and significant source of GHG mitigation financing in the seller countries. GIS could theoretically play a comparable role to CDM and JI combined in GHG mitigation until 2012, and it has the potential of contributing to a major amount of future GHG reductions, too, if set up well. In addition, it can bring significant revenues to the selling countries, in the approximate order of € 9 billion if we assume a price of €10/t⁶, dwarfing most other funds or budget items devoted to climate change mitigation or sustainable energy promotion in these selling countries, and thus representing a unique opportunity to address key climate change mitigation related priorities that could not or only hardly be financed through other carbon market mechanisms. Along with this it provides an opportunity for seller states to initiate emission reduction efforts in sectors which the carbon market, prioritizing on low hanging fruits, has so far not reached with emission reduction financing.

However, there is little time left for utilising this window of opportunity. GIS schemes and their legislative framework not only have to be set up by the end of the first commitment period, but the transactions completed, and probably even the AAU revenues disbursed. This gives an extremely short time for the development and operationalisation of the schemes. Due to a lack of research and experience on GIS, significant efforts and cooperation are required to unlock the benefits of GIS for both selling and buying parties.

The body of research and preparatory work on GIS is dwarfed by the orders of magnitude more attention that has been paid to CDM, JI, EU ETS. However, even despite the careful preparation and myriad of watchdog organizations following developments in CDM, JI and EU ETS, while the CDM and EU ETS have become important carbon finance mechanisms, their initial performance fell far short of expectations. Thus, while GIS has the potential to become a superior alternative flexible mechanism of emission reduction, there is a major risk that without careful preparation GIS may also fail to deliver what it is promising.

During the year 2008, significant developments took place regarding the establishment of GISs. In June 2007, the Hungarian parliament has approved an act on the operational rules of GIS, the pioneer national law on GIS implementation, and had secondary legislation in place by the end of 2007. Hungary was also the first to announce the first AAU transaction with Belgium for the sale of 2 million AAUs in September 2008 (MoEW 2008a), jump-starting the competition among CEE countries. Other countries in the region are also trying to get the system established, and several GIS schemes have been on

⁶ Although an EUR 10/tCO₂ price for greened AAUs maybe realistic as viewed in November 2008, the deals made public in Fall 2008 were concluded at higher prices than this.

the way to have a legal basis and a few more deals were brought close to conclusion just during the few months of this research.

Due to this very short window of opportunity, as well as its potential lessons to be learned for future climate regimes and carbon mechanisms, it is essential to understand better the potential implications of various decisions related to the design of a GIS. It is pivotal to assess GIS developments to this moment, as well as lessons for it to be learned from other carbon finance mechanisms, to provide advice on the modalities of the scheme and insights into how GIS can be optimized to deliver its goals. With the Hungarian GIS already under implementation, and the first commitment period of the KP having commenced in 2008, this report combines an analysis of new trends on the carbon market with directions GIS have been taking in the CEE region. The study aims to serve as a policy support document for countries that seek to establish a GIS in the upcoming years in the CEE region, as well as a policy research of general interest in relation to this special financial mechanism.

1.2 The need for research on GIS

The key characteristic of GIS is that currently there are no substantial international rules that regulate it, in contrast to the project based Kyoto Protocol flexible mechanisms (FMs). Today all other emission reduction schemes are under international or regional agreements or regulations. In other words, these mechanisms are regulated under commonly agreed protocols, which act as "goal keepers" for their environmental integrity. CDM and JI must comply with the Kyoto Protocol, with the Marrakech Accords, as well as with the broad range of decisions by the CDM Executive Board and JI Supervisory Committee. The voluntary markets of emission trading are conducted by commonly agreed protocols, which are mainly charged by the International Emission Trading Association and other international associations or other rules on liquid markets.

In contrast, after having complied with the KP and the Marrakesh Accord's rules related to IET⁷, all decisions related to GIS architecture or acceptability are merely at the discretion of the two governments: the buying and the selling one. GIS is a "hybrid" of two mechanisms: International Emission Trading (IET) of the AAUs as defined by the KP's Article 17, and the greening activities from the revenue from their sale. While IET is regulated by the Kyoto Protocol, the

⁷ For EU member states, the EU Emission Trading Scheme (EU ETS) has also relevant requirements that have to be fulfilled first: as some AAUs are converted to EUAs, countries part of the EU ETS may only sell surplus AAUs that have not been converted to EUAs (EUAs once converted can only be transferred back to AAUs under limited conditions). EU ETS can pose a demand on the Kyoto Commitment Period reserve of the given country as it allows for the in and outflow of AAUs from the national registry of a given country – outside the control of the government of that country (EC 2004).

Marrakesh Accords and the COP/MOP decisions, the greening activities are not covered by international regulation.

This high degree of freedom, flexibility, lack of previous experience and track record provide both advantages and risks for setting up GISs. One of the advantages is that in principle the scheme can be applied effectively to any GHG mitigation activity found acceptable by the selling and buying parties. For instance, it could target areas that currently have not been affected by other key mitigation measures (such as building energy-efficiency retrofits), or that are crucial but gain little benefit from policies or support measures. GIS opens a major financial opportunity for areas with significant climate mitigation benefits, but hard-to-reach by other policies or measures in the pipeline, for example energy efficiency in the building sector (Ürge-Vorsatz, Novikova, and Stoyanova 2007), or land-use activities. If designed carefully, GIS could overcome the barriers in areas where significant emission reduction could be realized.

Another advantage of this “virgin” nature is that GIS has started to shape only during the past few years, and thus **could potentially be elaborated to become a superior carbon finance instrument, avoiding the pitfalls of other existing ones, and perfected based on the experiences learned from several years of their operation.**

It could also serve as **a testing ground for an important potential future carbon finance mechanism:** if the scheme works well, the model could be applied for the recrafting of the KP’s flexibility mechanisms beyond 2012, for voluntary schemes in developing countries, or other setups. If the scheme proves to be effective in harvesting potentials not-easy-to-reach by other mechanisms, the scheme could be considered to be continued even within Annex I countries. For instance, in the future EU ETS auctioning revenues might be earmarked for climate spendings through extended GISs. In this report, we refer to GIS after the first commitment period as second generation GIS reflecting the fact that its financing source, legal setting and setup may all be different from the first generation GIS operating within the first Kyoto Commitment Period..

Thus, while there is a strong temptation to engineer GIS in a similar framework as the other two KP FMs (CDM and JI), a modified architecture could also “correct” the failures or shortcomings of other existing instruments, and test the ground for a new carbon finance mechanism that might be applied more broadly in the future in areas where the present policies/instruments have limited effectiveness.

At the same time, the lack of previous experience and extensive background research poses the risk that even the most optimally designed systems may not

bring the desired effect. The potentially up to €9 billion to be spent in the CEE countries on climate-related activities from GIS revenues in the coming 3-4 years is a significant enough sum that its spending options desire careful preparation also from independent organizations. Therefore, in order to exert the full potential of GIS as a financial instrument for global climate change mitigation, as well as for the selling countries' benefits, it is important that the different architecture options and their economic and environmental impacts are well studied and each national or bilateral GIS scheme is designed with a profound understanding of the consequences of these choices.

Finally, GIS is presently applicable for the Kyoto Protocol first commitment period, i.e. 2008-2012. Given the fact that the first commitment period has already started, the time left for GIS to realize its full potential is limited. While lessons learnt from GIS can be well utilized for future schemes, it is unlikely that GIS will continue in its present magnitude for the same host countries. Therefore, first generation GIS offers a unique one-time window of opportunity, which should also be taken into account during its design.

Beyond being a one-time unique window of opportunity presently not available to other countries than CEE countries, the short timeframe also poses significant risks. After half a decade of moderate progress, in the past few years actions on GIS have significantly accelerated. For instance, as of October 2008, in Hungary as well as in Latvia the legal framework and institutional system for GIS are in force. The Czech Republic, Ukraine and Romania have adopted general legislature on GIS [PC 6, PC 12, PC 13]. Bulgaria, and Poland demonstrate a strong interest in the development of the scheme (Budzanowski, 2008; PC1; PC12). In September 2008, Hungary sold 2 million AAUs to Belgium as a pilot transaction (MoEW 2008a), and announced a further sale of 6 million AAUs to Spain in November 2008 (MoEW 2008b). Ukrainian and Romanian officials expect their first AAU deals to take place by the end of 2008 or early 2009 (Filonenko 2008; PC9).

However, architectures designed under significant time pressure and the lack of time for learning from the early experiences pose major risks for the effectiveness and integrity of GIS schemes. This research therefore aims to fill a part of this gap by integrating an assessment of past lessons from flexibility mechanisms, the carbon market, and early GIS experiences, to assist the design of more solidly grounded new schemes.

1.3 The approach used in this report

Carbon finance mechanisms can be and have been observed and assessed from many perspectives. Since governments and private funders have

commissioned several consultancy studies on the potential design of GIS in individual countries and how to protect their interests through GIS, this report takes a different approach. In harmony with the mission of Climate Strategies, the goal of this report is to assess how GIS can be optimized for the global good. More concretely, **the report adopts a perspective that strives to control global warming at as low levels as feasible, while observing the sustainable development objectives of the societies concerned:** i.e. the selling and the buying ones. Keeping this goal as an organizing principle, the report does not extend to cover areas that are important to GIS for potential stakeholders but are marginal to its overall effects on climate and society.

More concretely, the report observes the following goals for GIS optimization:

1. **Benefiting the climate.** Optimising GIS to contribute most to global climate change mitigation may not be the same as delivering the highest amount of AAUs through the scheme. Issues such as the crediting period, greening ratio, lifetime of the measures, spillover and multiplier effects all determine the long-term effectiveness of investments through GIS for the global climate.
2. **Benefiting the societies of buying countries.** Since the main aim of spending taxpayers money in the buying countries is to benefit the global climate (mainly on the mitigation side), this perspective is taken as identical with the previous point. This report will not discuss commercial interests of the buying countries, such as increasing market shares of domestic products and services of the buyer to the selling countries.
3. **Benefiting the societies of the selling countries.** EITs consider that they “earned” these emission credits through major economic hardships, and thus its revenues should benefit the societies of these countries, as well as promote sustainable development. Therefore measures with large societal co-benefits, such as employment creation, alleviating fuel poverty and poverty, contributing to energy security and new business opportunities, improved competitiveness, regional development – should be prioritized.

Observing these three principles, investments with the highest economic efficiency to produce AAUs often may not coincide with those bringing broader social and climate benefits. Cherry-picking and thus capturing the lowest-cost investment opportunities that result in a high number of AAUs during the crediting period, such as replacing incandescent lamps by CFLs, often do not ensure a long-lasting climate benefit. Continuing with the example of efficient lighting, it is likely that incandescent lamps will be phased out by EU legislation in the near future anyway, thus the benefit of such measures would be limited to

the emissions saved through this earlier action. Since the EU (and some non-EU countries also, but to much lesser extent) have enacted a very broad spectrum of climate-related actions some of which are still in the pipeline or only on the drawing board, GIS actions in these areas will not necessarily have long-term benefits, or GIS revenues will just be used for easier compliance with EU efforts (also important). At the same time, GIS could offer a “fix” to some areas with longer-term investment needs that are difficult to spur with other policies and measures, such as sustainable infrastructure development and retrofitting of the old and inefficient building stock or forest protection. **Targeting such difficult-to-reach areas rather than harvesting the low-hanging fruit is also more in harmony with the nature of first generation GIS: there is only a short window of opportunity for this unique instrument that is unlikely to continue to the future.**

1.4 Aims of this report

Based on the background, research needs, and discussion on approach taken, the aim of the report is to support the development of GIS schemes that optimize its benefits to climate change mitigation as well as society.

The goals of the report are:

1. to provide recommendations that maximise the benefits of GIS schemes for the global climate, as well as the societies and environment of the selling countries.
2. to summarise lessons from the past experiences from the other flexible mechanisms, CDM and JI, and provide recommendations how GIS could be designed with an aim to overcome their pitfalls and become a potentially superior instrument to deliver climate change mitigation and sustainability benefits.

More concretely, the report answers the following questions:

- What is the role of GIS on the carbon market? What is its theoretical potential and what seems realistic at this point in time?
- What could be the key priorities and objectives for GIS?
- What are the main modalities for its architecture?
- How do the different modalities influence the effectiveness of GIS on the identified priority areas?
- What lessons can be learned from CDM/JI for optimising GIS for climate and society?
- What are the recent developments in GIS in the CEE region?

- What architectures have been chosen by the front-runners, and what are the options for the upcoming schemes? What can we learn from these very early developments?
- What recommendations can be drawn for maximising benefits of GIS architectures for climate and society and learning from the lessons of CDM/JI, observing the developments that already took place in GIS in the CEE region?

1.5 Limitations of the study

As mentioned, the report does not extend to the discussion of commercial interests. In addition, the report's main geographic focus is the CEE countries that have joined the European Union, since the challenges for GIS are very different in non-EU countries such as Russia and Ukraine. We do provide a brief overview of their status of GIS, but do not analyse them further. The report also does not aim to provide an extensive legal analysis of how GIS fits into EU legislation, although we identify the major legal areas that confine GIS in the EU member states.

Another important limitation of this report stems from the fact that GIS is an extremely dynamically developing field, and thus the GIS scene constantly changes. However, it is not possible at every moment in time to keep the entire span of research in this field updated. Therefore, this report reflects the situation when the research was conducted: Summer 2008. Efforts were made to include recent developments during the writing and review process, but it is not possible to strive for complete relevance on all issues reflecting fall 2008 conditions.

1.6 Structure of the report

In accordance with the research needs and approach described above, the paper is structured as follows:

Chapter 2 introduces the methodology of the research this report is based on.

Chapter 3 explains the concept of Green Investment Schemes and its background. It also identifies GHG mitigation potentials and priority target areas for GIS measures in eligible countries. Key modality elements of GIS architectures are reviewed in detail, which shall serve as an analytical framework for the assessment of GIS designs. Finally, several other factors

which influence GIS development are discussed, such as risks, the impact of other legislation, and lessons learned from CDM/JI.

Chapter 4 looks into the carbon market, its key players and price developments, with particular focus on the role GIS can play in balancing the Kyoto market. Future prospects for the market situation are also discussed.

Chapter 5 maps out the state of GIS development in the CEE region. The situation in major selling countries is analyzed in detail. This is followed by a summary of countries' progress on GIS and an overview of modality choices and priority areas selected by different countries.

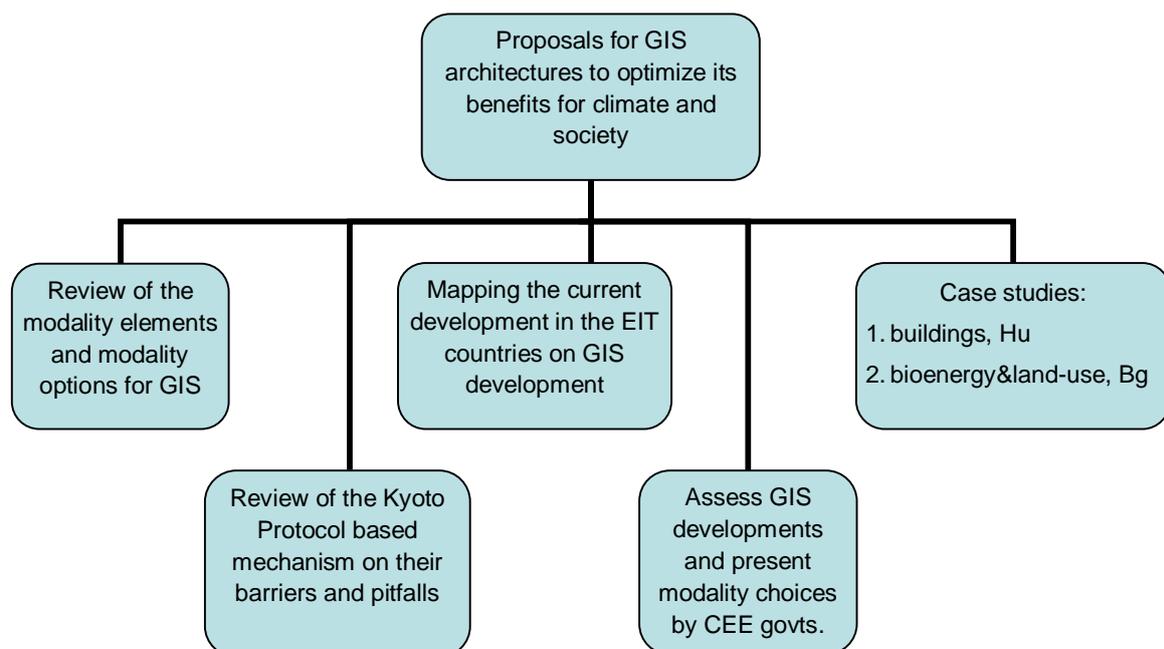
The chapter also summarizes three GIS-related case studies: fostering energy efficiency in buildings in Hungary; bioenergy in Bulgaria; and land-use as well as bioenergy in Romania. The chapter draws conclusions for GIS projects from the findings of the case studies.

Chapter 6 concludes this report and summarizes recommendations for GIS design in order to optimize its benefits for climate and society.

2 Methodology

The purpose of this research is to make recommendations on how GIS can be optimized for climate and society, given the fact that there are no specific international regulations for GIS. Figure 2 reviews the main elements of the research. First, research is based on past findings of the authors as well as a literature review of past research on various issues related to the architectural design of GIS and issues related to the architecture's arrangement. Based on the literature review, the authors identify the basic modalities to be considered in the architectural design of a GIS.

Figure 2. Schematic outline of the research plan



The review of the Kyoto flexible mechanisms, CDM and JI, is based on desk-top analysis and discussions with experts. This process aimed at analyzing the experiences and lessons from the Kyoto Protocol's project based mechanisms for the purpose of optimising GIS architectures.

An empirical analysis follows of the current status of GIS development in the EIT countries. This part of the research was carried out through interviews of the officials in charge of GIS development in the EIT countries as well as an expert workshop held in Budapest in May 2008 with the involvement of key experts from the field. The interviews were based on a written survey distributed at the workshop.

In order to shed light on the details and the inner dynamics of GIS, three case studies were conducted. The case studies analyzed in detail how GIS can be optimized in high-priority mitigation target areas identified in earlier sections of this report, and how choices in GIS modalities impact its effectiveness in these target areas. The in-depth case studies included the promotion of bioenergy in Bulgaria, bioenergy and land-use in Romania, and improving energy efficiency in buildings in Hungary.

The final component of the research involved the use of the modality table as an analytical framework to assess the effectiveness of GIS architectures in the CEE region and to draw recommendations on optimized modality choices to arrive at different GIS aims, or to facilitate investments in different target areas. This section integrates the findings of the previous sections.

Table 3 reviews the different methods used for the different components of this research.

Table 3. Research methods and how they serve the various objectives of the research

| Research components | Method of research |
|---|---|
| 1. GIS architectures and modality options | Desk research: past literature on GIS, from the literature identify key modality elements. The modality and modality elements then used as a template to review each country's GIS development. These elements and options of modality serve as a basis for the GIS modality design. |
| 2. Review of the experiences with the Kyoto Protocol's flexibility mechanisms: CDM and JI | Desk research: a) UNFCCC rules and regulations on CDM and JI; b) Literature on the barriers and constraints of CDM and JI; c) Expert consultations |
| 3. Empirical analysis of the current status of GIS development | a) Survey: A survey was developed based on the modality elements and options after the review of the literature on GIS. The purpose of the survey was to identify the options these countries are choosing in the modalities of GIS; another survey was developed to shed light on the buyers' preferences on modality choices, which is also based on the modality elements and options identified in the first part of the research; b) Interviews: interviews served as a supplementary tool for the survey to further identify the details of modality choices countries made in GIS. |
| 4. Case studies | Detailed assessment of the impact of modality choices on the effectiveness of GIS in selected high-priority target mitigation areas and possible project types: a) improved energy efficiency in buildings, Hungary b) bioenergy, Bulgaria c) land-use and bioenergy in Romania |
| 5. Analysis based on the findings in previous steps | Analysis and compilation of the findings from the previous sections and proposal of modality choices to optimize GIS architectures to meet specific climate and societal goals, as well as serving best the chosen target sectors. |

3 Designing green investment schemes: modalities and their impact on the effectiveness of GIS

Since there is no global protocol determining the greening activities in GIS, it is the choices in its architectural design, along with other local characteristics, that fundamentally determine the effectiveness and its impacts and the challenges it encounters. This chapter identifies the key modality elements of GIS architectures that need to be determined for each GIS. These modality choices are then used later as an analytical framework for the assessment of GIS developments and GIS schemes existing or planned.

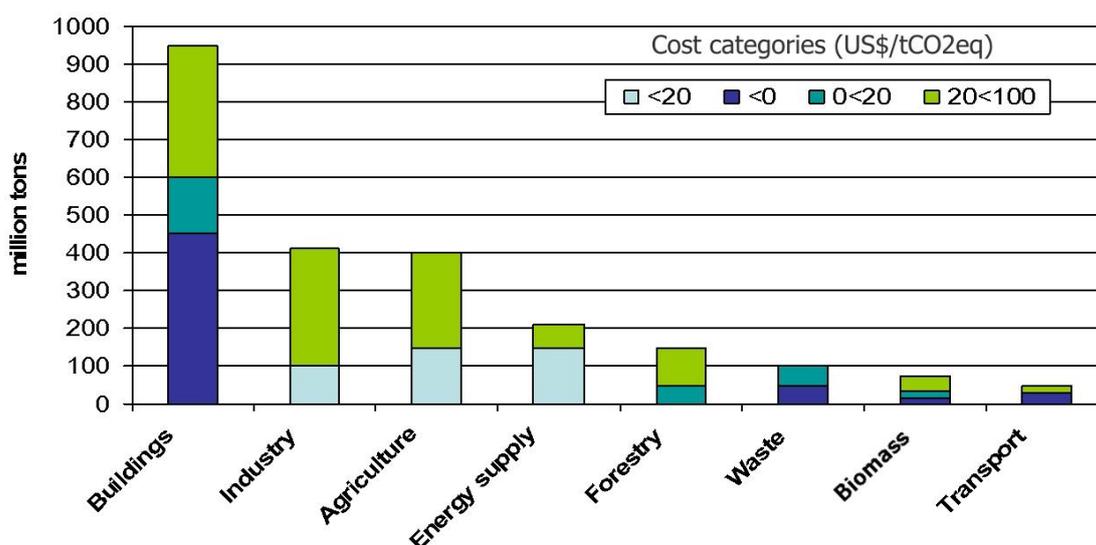
3.1 Background: mitigation potentials and costs in CEE

To identify target areas for GIS in emission reduction activities, an overview of emission reduction potential of various measures needs to be taken into account for a given country from two perspectives: cost efficiency of a given measure, and the total size of emission reduction potential of the given measure. The challenges are arising from the fact that there is limited information available in CEE countries on the mitigation potential of given measures.

According to the findings of IPCC (2007), there are significant variations in the mitigation potentials and their cost-efficiency contingent upon the region as well as upon the sector. Particularly, there is a significant cost-effective and low-cost potential in Non-OECD and EIT. This can be illustrated by the fact that during the period of 1990-2004, overall energy efficiency improved by 10% and 14% in EU-15 and EU-27, respectively, showing that much of the improvement came from the New Member States (Odyssee 2006; Odyssee 2007; Bertoldi and Atanasiu 2006) where „low-hanging fruits“ are still more abundant than in EU-15. The necessity to capture the untapped energy saving potential in EIT is reinforced by the fact that energy intensity at purchasing power parities in most of the New Member States is markedly higher than in EU-15 (Lapillonne and Pollier, 2007a; updated in September 2008). With regard to the transport sector, the difference between EU-15 and New Member States is even more pronounced: not only are the energy consumption trends in 1996-2004 on average significantly higher in EU-10 than in EU-15, but, this gap is increasing over time (Lapillonne and Pollier, 2007b).

Furthermore, while the IPCC (2007) asserts that the most important area for low-cost GHG mitigation potentials is the buildings sector in every world region, this is even more important in EIT. The cost-efficient potential in this sector reaches as high as 52% in developing countries, 37% in EIT and about 25% in developed economies (Urge-Vorsatz and Novikova 2008),. As Figure 3 demonstrates, by 2030 about 440 Mt CO₂-eq. can be mitigated in EIT at negative cost and more than 150 Mt CO₂-eq at 0-20 USD/tCO₂-eq. Apart from CO₂ reduction, energy saving potential in the buildings sector has proven to be among the most efficient in relation to its cost: best practices show that it is feasible to cost-effectively reduce GHG emissions in individual buildings by over 80% (Harvey 2006).

Figure 3. Forecast for GHG mitigation potential in differect sectors of EIT in 2030 – Please note that the potential figures are not necessarily additive. (Source: Urge-Vorsatz and Novikova 2008, with data from IPCC 2007)



As to the potential of renewables in CEE, it is very heterogeneous. For example, Black and Veatch (2003) argue that biomass might be considered the most plentiful and promising energy source in this region and thus the bio-energy sector offers significant emission reduction potential for CEE countries. Most of these countries have large forest and woodland coverage, ranging from 20-55% cover (Viglasky et al., 2004) and therefore a large potential for the use of wood residues or residues from wood industry for energy production. The potential for crop residues use as a source of bio-energy is largest in CEE countries which have extensive areas of arable land. For some CEE countries however, such as Romania, existing biomass resources are inadequate to meet the ambitious future EU targets and they will need to grow energy crops. Some CEE countries have significant scope also for forestry activities, such as afforestation/reforestation in Russia, Ukraine and Romania, or forest

management in Poland and Romania⁸. In Russia, for example, it would be possible to enhance the sequestration by 20 MtC/yr for less than \$13/tC (Zamolodchikov, 2006).

In addition to their contribution to climate change mitigation, GIS projects come with a broad range of socio-economic, political and environmental dividends. For instance, investments in building energy efficiency can yield a wide spectrum of benefits beyond the value of saved energy and reduced GHG emissions, such as health and comfort improvements, improvements in social welfare and reduction of fuel poverty, employment creation and new business opportunities, higher energy security, increased real estate value, and reduced social pressures from energy tariff increases. Avoidance of forest fires and potentially increased biodiversity are co-benefits of the projects in conservation based forestry and land-use sectors. While these co-benefits are often not quantified and included into the cost-benefit analysis preparing decisions, or often are not even identified by the decision-makers, they often are the primary reasons why a particular investment/policy is pursued.

After the thorough review of possibilities, potentials, costs and co-benefits of emission reduction in a given country, the primary priority areas should be checked against the feasibility of the GIS scheme in the given area and its transaction costs. Careful design is needed in order to balance between the quality and transparency of the given mitigation measures within the GIS on one side and the transaction costs and the time demand of organizing the implementation on the other side.

3.2 Origin and early development of GIS

The issue of GIS was first officially initiated by the Russian Federation at the Sixth Conference of the Parties to the Kyoto Protocol (COP 6), in 2000, as a way to address the excess AAUs due to the economic recession of the economies in transition (Tangen et al. 2002). There is only one legal reference to GIS: Decision 10/CMP.2 in the UNFCCC rulebook which refers to the principle of GIS under the Kyoto Protocol. This decision inter alia welcomes that Belarus will use any revenues generated from transfer under Art. 17 for further greenhouse gas emission abatement measures. After this, several studies were carried out to further explore the mechanism (see, for example, WB, 2005; WB, 2006; Korppoo, 2003), with a focus on Russia and Ukraine, which host around 70% of the surplus AAUs (Gorina 2006). However, the development of GIS in Russia has slowed down in the recent years.

⁸ Based on an assessment by the Quest JIFOR project and FAO data on available land

The recent development trends show that the CEE countries have been catching up fast in terms of GIS development since 2005. Several studies and consultancy reports have been completed on a country basis on the feasibility of establishment of national GIS schemes, although many of these are not publicly available. Small countries, with larger flexibility on setting national law on GIS and establishing administration structures, have been moving fast in GIS in the recent years. As discussed above in section 1.2, as of October 2008 there are two countries that have already finalized national legislative and institutional set-up for GIS: Hungary and Latvia. The first greened AAU transaction has been announced publicly between Hungary and Belgium in September 2008, with several others likely to follow shortly.

3.3 Definition and major concepts of GIS

3.3.1 The components of green investment schemes

As stated above, GIS is the greening of surplus AAUs through earmarking the proceeds from the sales of AAUs and channeling them to investments resulting in GHG emission reductions or general environmental improvements. (Tangen et al. 2002, Atur et al, 2004). The establishment of GIS is a (voluntary) governmental action. From the perspective of the host country, the GIS can be divided into two connected components:

a) International Emission Trading (IET) element: the process of making a deal with the buyers on the sales of AAU; this part is covered by the Kyoto Protocol under the regulations related to International Emission Trading;

b) Domestic Greening element: the process of implementation of the “greening” activities with the sales of the AAU revenues; for this part, there are no internationally agreed regulations. This part is largely determined by the modality choices of the GIS architecture, such as how the GIS is structured, how the greening is defined, etc., and how to respond to the potential buyers interests.

The buyer’s decision on the purchasing of AAUs is dependent on the design of the domestic implementation of the greening activities, transparency of the given implementation and the price range connected to the various features of the GIS.

The following sections review some key issues for GIS.

3.3.2 Eligibility criteria for participating in GIS

The transaction and agreement between the buyers and sellers follow the rules under the Article 17 of the Kyoto Protocol, under the International Emission Trading (IET). Under IET, the Kyoto units and other regional or domestic units can be transferred and acquired between Annex I countries.

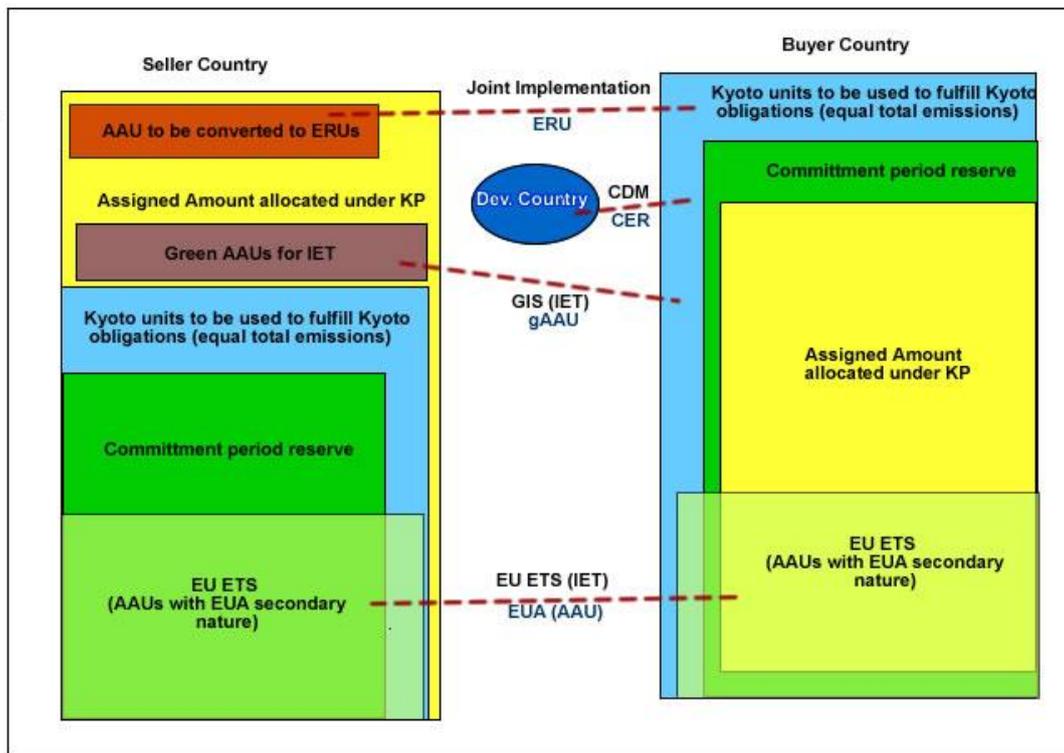
The eligibility criteria for a country to participate in IET are the following (UNFCCC 2001):

- The country is a Party to the Kyoto Protocol (Annex B);
- Its assigned amount has been calculated and recorded in accordance with relevant guidelines and decisions;
- It has in place a national system for the estimation of emissions by sources and removals by sinks of all greenhouse gases;
- It has in place a national registry;
- It has submitted annually the most recent required inventory;
- It submits the supplementary information (e.g. on sinks) on assigned amount and makes any adjustments and recalculations required.
- Submit supplementary information related to the AAUs.

In addition to complying with IET eligibility requirements, mandatory set-aside requirements (commitment period reserve) also need to be satisfied under Kyoto rules. In case of a country hosting JI projects, it needs to make sure that the needed AAUs will be available for conversion to ERUs (for planned JI projects). Thus by calculating the available AAU amount for sale, the AAUs that will be converted to ERUs can not be taken into account. If a country aims to bank AAUs for the next commitment period, these AAUs can not be part of amounts for sale under IET in this period either.

Countries participating in the EU ETS are subject to further legal requirements to be eligible for AAU sale. As AAUs are converted to EUAs, countries part of the EU ETS may only sell surplus that is not converted to EUA (EUAs once converted can only be transferred back to AAUs under limited conditions). However, these units can be part of the mandatory set-aside. As introduced in the previous section, under Art. 17 of the Kyoto Protocol, legal entities may also be authorized to take part in GIS by countries which are eligible for IET. Figure 4 shows the relationship and amount of various earmarking and unit moves between buying and selling countries including EU ETS and an extra link for CERs.

Figure 4. Transaction types of carbon assets among countries under the Kyoto Protocol including transactions under the EU ETS. The example of a buyer and seller country.



Fulfilling the Kyoto eligibility criteria for IET is important for EU member states as these criteria are also necessary for being able to trade within the EU ETS – which is also seen from the aspect of Kyoto Protocol as part of utilizing the IET, when it comes to transactions over borders of countries. One already resolved bottle-neck for the GIS regime was the technical possibility of transferring AAUs from sellers to buyers. Up until October 2008, only five countries (Japan, New Zealand, Switzerland, Russia and Hungary) were connected to the UN IT system (ITL) which allows transfers of AAUs. In October 2008, the link to the EU ETS IT system (CITL) was established and subsequently all EU member states have become able to transfer AAUs technically too.

3.3.3 Major stakeholders in GIS

As identified by Tengen et al (2002), there are two levels of actors in GIS: government and private actors. Table 4 illustrates different concerns and responsibilities of the actors.

Table 4. Stakeholders in GIS (Adapted from Tengen et al. 2002)

| | Seller side: responsibilities | Buyer side: concerns |
|-----------------------|---|--|
| Government | Establish the GIS, which ensures the greening of AAU; Management of revenue from GIS to ensure the greening process implementation; Conduct verification, monitoring process to ensure the greening | The design of GIS ensures the greening of the AAU; The management of the AAUs is transparent and ensures the money is spent on agreed areas; Necessary monitoring and evaluation are in place. |
| Private sector | No private sector on selling side | Same as above |

GIS is currently an activity mainly at the governmental level. Under Art. 17 of the Kyoto Protocol, entities may be authorized by countries who themselves are eligible to be part of the IET to take part in the IET. The mode of the authorization however is regulated at the national level.

As non-compliance is the risk of the countries themselves, the Kyoto rules do not specify the term of "legal entity" and leave it up to states to interpret this term as well as the specific requirements. "Entities" can be both legal and private persons under different legislations. Regardless of the method of authorization, the final responsibility to adhering to Kyoto rules rests on the shoulders of the authorizing sovereign Parties.

As of November 2008, only Japan allows for legal non-governmental entities to purchase AAUs. The authorization is available for those entities which hold accounts in the Japanese national registry. There is no formal limitation for these Japanese entities to buy AAUs..

There is an authorization in preparation for companies to participate in the emission trading scheme of New Zealand. The intention is that the government filters from which country the authorized companies are allowed to buy AAUs. The NZ government has announced that it would only allow companies to use credits from countries that promise to use the cash for some environmental benefit. Details are so far missing (Point Carbon News 9.10.08).

In the past years, discussion on exclusion of private buyers' participation emerged in some host countries as well, especially in the case of Romania (Andrei, Relicovschi, and Toza 2006). The major reason for these countries to exclude the private buyers is the legal nature of the AAUs under their national legislation (AAU treated as a national asset, thus are not open to private market; for more information on this, please see later in this section, in section 3.3.2 and in Annex 1). However, in recent years, most hosting countries have opened the GIS scheme to private buyers. Even in Romania, the decision of inclusion of the

private buyers is being discussed by the government at the time this research was conducted⁹.

EU-based companies subject to ETS allocations would in principle be interested in Kyoto credits as their price is presently lower than EUAs. However, AAUs can not be transferred to the EU ETS system under the current rules. AAUs, under specific conditions of the national legislation, may be bought by entities too, but in practice, companies are not motivated to buy these AAUs as they can not transfer them to EUAs. Thus, the most likely purchasers of AAUs under IET(/GIS) in the EU are countries (and not entities) that need additional AAUs to meet their Kyoto commitments. The same argument may apply for non-EU entities as well, as AAUs can only be used by Kyoto parties to fulfill their international obligations, and even though entities can hold them and trade with them, their purpose is limited and state related (see the discussion above with regard to Japan and New Zealand). Thus, under current national rules non-EU countries that authorize legal persons, too, to participate in the IET on their behalf (thus are eligible buyers in GIS) are Japan and potentially in the near future New Zealand.

Table 15 in Annex 1 lists which EU countries authorize private physical persons and other private entities to be holders of AAUs. The countries that allow AAUs in personal account implicitly authorize AAU purchase for their citizens. However, the motivation of citizens is presently very limited, as they can only sell it to a government at the end, which may prefer to buy it directly from another state. They themselves can neither use it, nor transfer it to other Kyoto units or to EUAs. Along with this, holding AAUs in a given national registry has already a benefit for the given country as it increases the amount of AAUs available for fulfilling the commitment period rules mandated in the Marrakesh Accords¹⁰.

3.4 Prioritisation of target areas to be supported by GIS

3.4.1 Criteria to be used for prioritization and general considerations

As highlighted above, the potential revenues through GIS are significant. Therefore, there is clearly going to be major demand for this income within the selling countries, and probably a competition between target areas to use these revenues. This report presents the potential criteria that can be used to

⁹ Summer 2008

¹⁰ Decision 11/CMP.1 of Marrakesh Accords

determine the target areas for GIS investments, and then suggests a logic for ranking or prioritising these criteria and, thus, the target areas.

Based on the previous discussions, there is likely going to be an oversupply of greened AAUs on the carbon market amounting to up to 1.3 Gt CO₂-eq per year during the first commitment period (which sums up to 6.5 Gt CO₂-eq in 2008-2012), although as of November 2008 demand exceeded supply. As a consequence, if a country wants to maximize its revenues from AAU sales, the **most important criterion** to be observed should be that the country should establish a **GIS that caters most to the interests and priorities of the buyers.**

The following criteria towards the list of priorities reflect national interests, and may include the following:

- Maximizing the **cost-efficiency** of investments through GIS, or maximizing GHG savings from AAU revenues (i.e. maximizing emission reduction effectiveness from given AAU sales);
- Maximizing gains **towards national social, political and regional development priorities** (i.e. maximizing co-benefits), and
- Channeling the funds towards **GHG reduction needs** that are **important but are difficult to foster by business-as-usual policies or available/foreseeable support schemes and constitute additionality.**
- Practical feasibility and transaction costs of the given GIS model in the chosen target sector
- Transparency and accountability in the operations regarding GIS operations, along with other safeguards for buyers (e.g. third party audits).

Since some of these criteria may contradict certain areas needing support, it is important to establish a clear priority list among them. At the same time, this suggests that the third and second point should be considered to play the most important roles in determining priority areas for channeling GIS funds. This can be justified by the following argumentation.

Most AAU selling countries are expected to be subject to more stringent emission reduction commitments after 2012, in addition to the increasingly stringent targets related to EE, renewable energy generation, biofuels, and other related environmental goals of the European Union that also require indirect emission reductions. Therefore, it is likely that a substantial amount of reductions will take place in a business-as-usual scenario. This means that

complying with more ambitious GHG reduction needs will require ambitious actions in areas that are not easily tackled by other instruments, or where the investment needs are so substantial and barriers to profit-based investment retrieval are so significant that they are hard to be borne by either private actors or public support.

Since GIS revenues represent a rare, one-time, but potentially significant window of opportunity for mitigation financing, it is advisable to direct this to GHG reduction priorities that are important but cannot be easily tackled by other means in the near future. In addition, if political, social and development gains are considered as key factors of selection, this will maximize national benefits from the utilization of GIS revenues. Finally, **additionality, and therefore the environmental integrity of GIS, is also questionable** if GIS investments capture the low-cost potential in areas where existing or incoming legislation requires emission reductions in the near or mid-term anyway.

Before we identify the areas that best satisfy these criteria, let us understand the **interests and decision criteria of potential buyers**, since we stated that these will be used as the primary factors of selection of a GIS architecture in a buyers market. Based on our extensive research and interviews¹¹, it can be stated that the **first and foremost criterion of potential AAU buyers is the credibility that the entire GIS revenues are fully utilised towards the goal of GHG reduction** – sometimes referred to as the “credibility risk”. A potential buyer stated that minimization of this “credibility risk” was the most important factor in determining where the AAUs will be procured from.

The credibility risk is gauged by the general international perception of the business climate and financial reliability of the country, as well as by previous experience in similar transactions, such as those through JI. It can be further mitigated by a GIS having an **institutional and financial management structure** that is the **most transparent, and simple but the most credible and reliable in terms of fulfilling its primary goal.**

Along these lines, most buyers also want to be assured of additionality – i.e. that **GIS revenues do not replace present, planned or foreseen budgetary spendings**, or are used towards compliance with present or planned EU regulations or other international or national commitments in the pipeline. This would indirectly mean that the revenues are not spent on GHG emission reductions. Therefore, the **additionality** of investments spurred by AAU sales needs to be very clear to the buyer, and it is also the key to the environmental integrity of GIS.

¹¹ Since many of the interviews on this research item were conducted on behalf of the Hungarian government, some of these factors may be more biased towards buyer interests with a stake in Hungarian AAUs.

Additionality requirements could exclude some areas from GIS support, or make GIS support in those areas much more difficult. For instance, while there are no regulations that GIS revenues should not be invested in sectors covered by the EU ETS, host countries in theory are not interested in it as the EU ETS provides a regulatory tool and financial incentive for such sectors to increase carbon-efficiency. Moreover, GIS intervention in these sectors might distort competition rules if applied without due consideration and fulfilling the necessary notification procedures of the EU.

In comparison to JI, GIS has the advantage that the so called double-counting rules of the Linking Directive (2004/101/EC) do not apply for GIS, since AAUs can not be used for accounting in EU ETS in contrast with ERUs generated from JI projects.

At the same time, supporting such projects results in an indirect subsidy for companies whose emissions have been directly or indirectly reduced (for instance, the power generator who needs to produce less as a result of some demand-side management activities from GIS revenues), therefore making the business competition uneven. Along with this, less production results in decreased revenues for power companies, thus the revenues of carbon-windfall profit become less important, not to mention that the general scarcity of allowances allocated free for installations reduces the chance of the generation of such windfall profits. Moreover, the argument that energy demand decrease creates distortion on the power market would apply to all state and EU subsidies and efforts to increase energy efficiency and reduce carbon intensity in the economies of the EU, thus would counter the general goals of energy efficiency and reduced carbon-intensity.

However, adopting similar guidelines as the Linking Directive does related to JI would not be the right solution and would be detrimental to the climate effectiveness of GIS. First, since AAUs cannot be counted towards ETS compliance, the rationale for the double-counting rules applied for JI do not hold. Second, such provisions would result in GIS not being possible to be applied to very important potential target areas hard-to-reach by present and incoming policies and measures in EU member states, such as building sector energy efficiency. Limiting GIS target areas to those already constrained territories where JI can still operate in the EU would significantly curtail the potential climate effectiveness of GIS, and may even question its value added as compared to Track-1 JI and the transaction costs for setting up a new scheme.

On the other hand, EU legislation regulates state aid issues in depth and development of GIS schemes should take these into account. However, the special rules applied in the field of environmental protection ease the difficulties

in establishing the GIS support scheme in several important target areas, for example in residential and public sector building energy efficiency.

It is important to note that the price of AAUs, while it is very likely to play a major role, has not been mentioned by many of the potential AAU buyer interview subjects or the literature as the first criterion for choice of the AAU seller. However, buyers might have budget constraints and fixed demands for carbon credits, which places a constraint on their ability to pay and might force them into compromises regarding the quality of the greened AAU product they purchase. Another emerging pattern is the diversification of purchases of different quality products thus diversifying risk as well as the attached price.

In addition to the confidence that the revenues are truly being spent on additional GHG reduction efforts, the type of greening is another important consideration for the buyers. While it could be expected that a hard greening with a high greening ratio¹² (i.e. where each sold AAU corresponds to an AAU saved, or a 1:1 greening ratio or GR) is the most desirable for buyers, no buyer that was interviewed insisted on an exclusively 1:1 GR. This is probably because the buyers recognize the limitations from strict emission reduction tracing. It is, however, very important for all buyers that **most of the revenues are used through hard greening**, and only a minority is channeled through soft greening. This is reflected in the design of most of the present GISs in CEE (see later). The acceptability of the portion to be used for soft greening depends on the particular buyer.

Most of the buyers interviewed are positive towards soft greening and they admitted that soft greening is crucial for climate mitigation. However, they also raised the question that soft greening would be difficult to verify and monitor. Thus, buyers are likely to have a strict pre-defined list of soft greening activities, which could ensure that the money will be spent at least on the areas mostly related to climate mitigation. However, among the list of soft greening options, buyers strongly excluded the possibility to use the money to build climate change negotiation capacity. Activities related directly to GIS management capacity building are the most favorable choice. Capacity related to climate change awareness raising is also one of the top choices, but some buyers prefer climate change capacity building to be in the same area as the priority target area, such as EE in buildings. Other choices such as building monitoring and observations on the climate system and building capacity on climate-related legislation and policy are less preferable choices. Money spent on other environment-related activities without direct climate benefits was not

¹² The terms hard vs. soft greening and greening ration will be elaborated in detail in later sections. For the purpose of the present section, hard vs. soft greening can be distinguished by the ability to quantify and verify the amount of emissions reduced, and greening ratio is the ratio of produced emission reductions from the revenues of one unit of AAU sold.

considered a favorable choice, although it may emerge in some GIS schemes in the end.

In terms of the target areas where AAU sales are invested, most buyers interviewed expressed their flexibility. However, most prospective purchasers of Hungarian AAUs explicitly identified the thermal retrofit of the old block housing stock as priority. Other buyers specified, in addition, the potential interest in expanding biomass production and use, as well as the promotion of new buildings with ultra-low specific energy consumption (such as passive buildings). Several buyers mentioned their interest in programmatic GIS – a modality to be explained below.

3.4.2 Suggested priority areas for GIS in CEE

Based on the understanding of the buyer's criteria as well as the key national and legal criteria suggested in this report, important priority areas for GIS in the CEE region are examined, as assessed by the researchers and based on interviews. This report, as discussed before, prioritises areas from the perspective of long-term benefits to the global climate as well as societal benefits for the host countries based on the logic described in previous sections and utilizing the research results outlined in them.

Retrofitting the old building stock with poor thermal performance

First of all, most assessments attest that improving energy efficiency (EE) is a global priority for GHG reductions (IEA 2006b; IPCC 2007; Goldemberg, 2000). This is even more true in CEE where energy intensities still lag behind those in EU-15 (IEA, 2006a), indicating highly cost-effective EE and GHG mitigation potentials (Bertoldi and Atanasiu, 2006, Üрге-Vorsatz and Novikova, 2006).

Within the broad area of improved EE, there is an area representing a significant contributor to GHG emissions that is very hard to reach by policies or market-based efficiency investments despite the rich fabric of EU legislation and ambitious targets in many areas. Retrofitting the old building stock with poor thermal performance, especially in panel block housing units, can save a major amount of GHG in these countries. For instance, if all cost-efficient energy efficiency options in the Hungarian household buildings sector were implemented, they would cumulatively reduce CO₂ emissions by 5.1 million tons by 2025. This is about 29% of total CO₂ emissions produced by the residential sector of Hungary in 2025 (Novikova 2008). A recent EURIMA report (Petersdorff et al. 2005) analyzed the impact of the EU Directive on Energy Performance of Buildings (EPBD) concerning the heating-related CO₂ reduction potential and its cost-effectiveness in comparison to the frozen efficiency scenario. The technical potential for eight member states (Hungary,

Slovakia, Slovenia, Estonia, Latvia, Lithuania, Poland, and the Czech Republic) was estimated as high as 62 million tCO₂ in 2015.

While a very important area for reducing overall GHG emissions, retrofitting inefficient residential buildings is perhaps the most difficult area to target, either by policies or through market-based instruments. The reasons are manifold. First, whereas investments are typically cost-effective, especially as a result of recent energy tariff hikes – the payback times are often quite long to make investments attractive, especially for tenants with high implied discount rates, such as the elderly, businesses with short-term profit horizons, and the poor. Business-based capturing of these potentials is also hard because an EE retrofit must also address other retrofit priorities (one cannot only improve insulation, but other building-shell related renovation must also be tackled at the same time), jeopardising or often cancelling the cost-effectiveness of the investments. In addition, it is hard for ESCOs or other profit-based energy service providers to invest in these upgrades because larger buildings, where the economies of scale justify the transaction costs of such retrofits, typically have a large number of owners and occupants, making it very difficult and expensive to arrange the legal, financial and logistical implementation of these retrofits. Many of these barriers translate into direct or indirect transaction costs, altogether amounting to significant portions of investment needs (see, for instance, Mundaca 2007; Sathaye and Murtishaw 2004; UNIDO 2003). This has proven difficult even with the leveraging of certain subsidies such as the carbon-revenues through JI. Therefore, a purely market-based solution is not possible.

Retrofitting existing buildings is hard to target by policies in general. The EPBD is a worldwide pioneer in this regard, mandating certain EE measures for the case of the major retrofits of large buildings. At the same time, the retrofit levels required by the EPBD are suboptimal from a climate perspective: if a major renovation is applied on a building, it is likely that no such effort will take place for the next few decades¹³. Retrofits that do not result in emission reductions to the levels allowed by state-of-the art methods, i.e. those close to passive standards, lock the building stock into extra emission-generating infrastructure for decades to come. However, more stringent regulation requiring very high energy performance presently is difficult because of the immaturity of the markets and the construction industry in this regard, and thus resulting high extra costs. At the same time, GIS applied in this area can provide the extra funding and push that helps these retrofits target more ambitious efficiency levels than they would under standard practice. Targeting GIS revenues in this area also helps with the significant social challenges related to such retrofits:

¹³ Major retrofits to the old building stock in CEE typically require the scaffolding of buildings, often the temporary relocation of residents for the duration of the construction – thus making such efforts not only very expensive but also very troublesome to the residents. As a result, it is important that when complex retrofits take place, the buildings are optimized from a long-term climate perspective.

the housing that is most in need of such retrofits is typically inhabited by population groups with the least access to self-financing or to capital markets. Therefore, while EPBD mandatory requirements may rather result in non-compliance or the delaying of regular retrofits due to the lack of extra capital available for the EE measures, GIS can address this problem and can provide the incentive to move towards low-energy renovation levels.

In summary, the thermal retrofitting of the old building stock is a high priority from the perspective of GHG emission reductions, but at the same time it is very difficult to promote by existing or planned policy instruments. The only tool that has been working in this field in these countries is the application of various subsidy schemes (such as the Polish Thermal Modernisation Fund, the Hungarian Panel Credit, the Czech Energy Agency, and others), however, due to the limited budgetary affluence of these countries, these funds have been limited to a small contribution to the overall retrofit requirements. In addition, some of these funds only assisted in the business-as-usual efficiency retrofits, i.e. no incentive was provided to go beyond legal requirements. Urge-Vorsatz et al (2007) review the funds disbursed by a selection of EE funds in the region (most of them are not exclusively for building renovation). The paper demonstrates that the potential GIS revenues can serve as a much more generous source to support the required investments into retrofits as compared to possibilities of the funds.

In addition to satisfying the criterion for important GHG reduction priority areas that are difficult to tackle through other instruments and measures, the retrofitting of the building stock also offers extensive political, social, developmental and other gains. These include the social and political benefit of reducing the burden of utility bill payments for the poorer population segments after the drastic tariff increases over the past decade(s); reduced energy dependence; freeing up subsidies that have been directed at helping the poor with coping with bill payments; reducing poverty and fuel poverty; and increasing the property values of the old building stock¹⁴.

Finally, while an important area of GHG emissions, buildings have not yet been addressed by other flexible mechanisms, in particular, JI or ETS (Novikova et al. 2006). Targeting GIS revenues in this field offers another attractive advantage for GIS: retrofitting of buildings is a clearly demonstrable spending, and while emission reduction verification and tracking may be expensive, savings are easy to estimate. The easily visible and traceable investments (for instance, the number of buildings insulated is easy to check) contribute significantly towards the buyers' demands for transparency and reducing the "credibility risk" without

¹⁴ The influence of energy payments on the property value of dwellings was well demonstrated in 2007 in Hungary. After a major increase in district heating tariffs, the market value of district heated flats has dropped significantly.

complicated M&V procedures. Due to its dispersed but similar nature, this sector is best tackled through programmatic approaches.

In summary, **this report argues that thermal retrofitting of the old building stock should be considered as one of most important priorities for GIS schemes in the CEE region.** This target area satisfies almost all criteria for prioritising GIS investments from both the buyers' and sellers' perspective (with the exception of maximising cost-effectiveness, according to which this is unlikely to be the leading option): it reduces the "credibility risk" perceived by the buying party; it can serve as the basis of a simple, transparent GIS scheme (due to the large investment needs, no fragmentation is needed in the target areas, because even in the case of an optimistic market scenario, all revenues could potentially be targeted to this area in most countries) increasing the attractiveness for buyers; it can make a significant overall difference in national GHG emissions; at the same time it is difficult to be targeted by other instruments; and it is associated with major social, political and economic dividends.

Another important question is that existing energy-wasting buildings can be thermally retrofitted to several levels of specific energy consumption – which one should be targeted? The economically/financially optimal target specific energy consumption level of the retrofit is determined by the interaction of energy prices, investment needs, energy requirement reductions, and any financial support that is available for the project (such as the GIS revenues).

However, from the perspective of the global climate, buildings will need to have extremely low, or zero, fossil energy consumption in the next few decades. Therefore, **retrofitting buildings at present to environmentally sub-optimal levels** (levels that are economically optimal today) **has major economic and climate repercussions.** Reconstructions affecting the building shell are expensive and cumbersome (often requiring the moving-out of the tenants), therefore if a building is going through such processes, a subsequent retrofit starting from an intermediate level of efficiency will have very high, if not prohibitive, specific costs (with low expected savings but required repeated procedures such as scaffolding, tenant relocation, etc). **Therefore, for long-term climate benefits it is important that GIS aims to support very low-energy thermal retrofits rather than the levels that lock-in today's economically optimal but from the climate's perspective substantially suboptimal levels.**

Other areas deserving consideration as prime candidates for GIS priority target areas are summarized as follows:

Biomass-based heating

Presently a lot of policies are aimed at promoting renewable electricity generation. However, as the Forres report has demonstrated (Ragwitz, 2005), renewable energy priorities are different for the new EU member states than for the old ones, since there is a much larger potential for renewable heat (mainly biomass, but also geothermal and solar), especially in non-grid based applications. There are few, if any policies promoting this area, and JI projects have also failed in this field (non-grid based biomass heat applications). At the same time, promoting biomass plantations and fuel switch to biomass-based district heat will also be associated with significant economic, social, environmental and political gains, such as relieving the social stress of decreasing agricultural demands in these countries through converting agricultural enterprises to biomass-growing ones. Some of the CEE countries, such as Latvia and Bulgaria, have a large unexhausted biomass potential, and thus a large scope for biomass projects. In countries, where the district heating network is not expected to be significantly expanded in the coming years, such as in Bulgaria, a fuel switch to biomass could be implemented in households or municipal buildings, leading to significant additional socioeconomic co-benefits, such as job creation in rural areas, decreased energy costs and an improvement of the forest condition, as a result of additional thinning and harvests. Some of the CEE countries however, such as Romania, have a lack of biomass. Bioenergy projects would have to be combined with biomass plantations in order increase the supply.

An important caveat regarding the use of biomass burning is that if it is used on small scale, but in large numbers, it can result in severe deterioration of local air quality as inefficient boilers and the characteristics of the smoke from biomass burning result in more harmful emissions than heating by fossil fuel burning. The solution can be medium scale boilers which can address air pollution issues better and have higher efficiency. Such boilers can supply district heating, but their application in heavily populated and polluted urban areas needs careful consideration.

Land-use activities

Land-use activities under GIS may play a prominent role in certain CEE countries, such as Russia, Ukraine, Romania, Bulgaria and Poland. In Romania for example there was a significant forest cut in the nineties, in Bulgaria forest fires in 2004 destroyed huge areas, which are only recovered by other means to a limited extent. In the Ukraine 2.3 million ha of land are degraded and polluted of which 1 million is suitable for forestry projects (Pasternak and Buksha, 2007). In addition, in some CEE countries, such as Romania, there is a lack of biomass for energy and industry. Land-use projects may create significant co-benefits, such as income creation for the rural population, increased biodiversity, avoidance of forests fires, and in some cases also synergies with

adaptation, for example when carrying out afforestation in areas where climate change increases the risk of erosion or droughts.

There is worldwide only one LULUCF¹⁵ JI project under implementation, the project called “Romsilva afforestation of degraded land” in Romania. LULUCF projects face significant more hurdles than other project types under JI and the CDM. While under CDM only afforestation and reforestation projects (“A/R projects”) are permitted, under JI it depends on which additional activities the host country has selected under the Kyoto Protocol’s article 3.4 (Article 3.4 activities are forest management, cropland management, grazing land management and re-vegetation). ERUs can only be issued for those activities that a host has elected to account for within the quantity limitations allowed by the provisions of Kyoto Protocol. Romania for example has elected forest management. In contrary, under a GIS any land-use activity is eligible; therefore the full potential of this sector can be exhausted. Other barriers specific to CDM/JI land-use projects are the need for large upfront investments and long crediting periods which lead to a delayed rate of return as trees need several years to grow until they can generate a significant amount of credits. Also this barrier can be addressed under a GIS as AAUs can be sold now for emission reductions and removals being generated in the future. Under a GIS any crediting period can be implemented, while under JI longer crediting period can only be implemented in the form of late crediting with AAUs. Finally, under GIS land-use projects much easier and cheaper monitoring requirements can be applied than under JI. Even though JI land-use projects do not necessarily follow approved AR methodologies for monitoring and estimation of net removals under the CDM, the need for full integrity of emission reduction of the project poses serious burdens on project implementers in terms of costly intensive monitoring systems, as well as validation and verification by independent entities. Under a GIS forest indicators currently used by the forest administrators would be enough to assess the progress in activity performance.

3.5 Designing GIS architectures: key modalities

As mentioned above, various choices made during the design of GIS schemes have an important influence on its transparency, environmental integrity, as well as on its impacts on climate, environment and society. The following sections review the key choices – modalities – to be made during a design of a GIS.

¹⁵ The term Land Use, Land-Use Change and Forestry (LULUCF) is used in this report only for land-use activities under the KP and its flexible mechanism.

3.5.1 Management structure of the hosting country's GIS

As expected by the buyers, the sales revenue from AAU trading should be earmarked and channeled to specific areas pre-defined in the contract. Since the way the funds are disbursed and whether they are indeed spent on real greening activities is one of the most sensitive issues for buyers, this requires a stringent management structure for the GIS. Various country case studies have proposed different structures for a sound and transparent GIS management (for example, see WB 2005; WB 2006; Stoyanova 2006). Several issues need to be addressed to ensure the transparency of the scheme.

According to WB (2006), the AAU sales revenue, after a transaction is concluded, has three possible ways to be channeled. The first is to enter the national budget within the consolidation process, and then be allocated to specific greening activities. Second is to enter the national budget without consolidation process, but to a separate fund, together with other special funds, such as a pension fund. In this case, GIS funds could be more easily earmarked and the funding could be more secure. The third option is that the money doesn't enter the state budget, but is kept as an extra-budgetary fund, for example going directly to a National Environment Fund, which is the prevailing method in CEE region. The last option is the most optimal one for managing risks, as the fund is separated entirely from the state budget, making it easier to trace the financial flows.

These three options have significant impact on the GIS funding. As for the first option, if the national budget is in a deficit, the GIS fund may not be certain to be allocated to the targeted area, although legal or contractual obligations from the bilateral agreements may also limit this risk. However, the situation also depends on national circumstances and the budgetary/financial discipline of the government.

The management structure of the GIS is another major concern of the buyer. According to WB (2006), the following key functions should be covered by different institutes to ensure a sound management of GIS:

- a) Institution responsible for AAU trading: responsible for finding buyer, negotiating with buyer on contract, coordination with the GIS management functional unit, etc.
- b) Professional fund management: responsible for fund management, fund allocation, calls for participation in the projects, etc.

- c) Supervisory body: reviewing the strategy of the GIS, such as the priority areas, project selection process, the fund management, etc.
- d) AAU management for compliance status and maintenance of the IET eligibility criteria: as the GIS is based on the trading of the surplus AAUs, it is crucial for the host country to manage their AAUs well to ensure that the committed surplus AAU is indeed available throughout the first commitment period. At the same time, the host should also be rigorous about the country's status regarding the fulfillment of the eligibility criteria and maintaining the eligibility criteria throughout the first commitment period.

3.5.2 Type of greening

Greening is the process that links the surplus AAU, which has limited environmental merit, with activities that can deliver environmental or climate benefits (Tangen et al, 2002. Blyth, W. and Baron, R. 2003), and thus how greening is defined in the particular GIS has pivotal ramifications on its environmental/climate impacts.

The first main choice is whether the greening activities funded from AAU proceeds must focus on climate change, or can include other environmental benefits. Even if climate change is the focus, the question is whether adaptation activities can also be funded, or there should be a focus on mitigation.

While several early GIS proposals included non-mitigation greening, it is increasingly unlikely that such activities will play an important role in GIS. The reason is that the money spent on purchasing AAUs mainly originates from the taxpayers, and the purpose of AAU purchases is to contribute to the stabilization of our climate through the compliance with the KP. Therefore the activities funded from its revenues should also focus on mitigation. Another reason is that while investments into mitigation have global benefits, including the taxpayer who contributed to the purchase, while the benefits of other environmental or adaptation activities are mainly confined locally.

There are two types of "greening" by the nature of the activities in the greening process. Hard greening refers to activities in which the greening process can deliver measurable and quantifiable emission reduction units. On the other hand, if the activities associated have non-quantifiable and non-measurable emission reductions, it is soft greening (Blyth and Baron 2003; Andrei, Relicovschi, and Toza 2006). Other measures not resulting in emission reductions, such as more general environmental measures also fall into the soft category. Typical hard greening activities include the investments into emission reduction technologies, such as renewable energy projects and

retrofitting of old buildings. Soft greening is usually a series of pre-defined activities, such as environmental education and capacity building related to climate change; demand-side management programs, technology development, capitalization of energy service companies, insurance funds for energy efficiency investors, dismantling of energy subsidies (Tangen et al. 2002; Blyth and Baron 2003; Andrei, Relicovschi, and Toza 2006).

3.5.3 Additionality requirements

As GIS is a voluntary scheme set up by the seller country, it allows flexibility regarding additionality requirements, which does not have to be explicitly part of the GIS. On the other hand, additionality criteria can be a guarantee for the buyer that through its purchase additional environmental benefits will materialize in the seller country. While doing so, the following additionality criteria could be taken into account:

- environmental/climate additionality (new environmental benefits will arise)
- legal additionality (there is no obligation under law to materialize the project/investment)
- financial additionality (there is no double support for the same emission reduction).

Under environmental/climate additionality the state has to ensure that the project/investment will cause novel environmental benefits, thus it cannot fund an already ongoing project that is funded by other resources on its own. Under legal additionality the state has to guarantee that the AAU purchase price will be spent on a project that shall not be carried out otherwise too under national or international, in case of EU countries, EU legislation, including legislation on state aid. This requirement is similar to the one applicable to the EU cohesion funds.

Financial additionality is also crucial to ensuring credibility of the seller country. On this, in EU countries Art. 55 on revenue generating is applicable, thus financial additionality needs to be taken into account on the project/contract level in the GIS.

As mentioned above, additionality can be regarded as a pivotal criterion to assure the environmental integrity of GIS. Even if the seller country does not require additionality in part of its GIS, the buyer may have the right under the individual contract to include all three dimensions of it into the purchase conditions. At the same time, this report also shows in later sections that stringent additionality criteria and its verification in CDM and JI have posed a

major barrier to the proliferation of energy-efficiency and other small-scale emission reduction activities.

Presently, however, many GIS host countries do not have explicit rules ensuring additionality. Hungary has legislation spelling out the criteria of various types of additionality requirements regarding JI. Along with this, Hungary intends to assure additionality in GIS, as it has already been practicing. For Joint Implementation, Hungary distinguishes among the three types of additionality mentioned above in Government Decree 323/2007 that needs to be legally enforced for all JI projects.

Financial additionality can be especially important for countries with stringent anti-competitiveness legislation, such as EU member states which need to comply with EU state aid rules. If the benefits derived from the investment from AAU sales are sold on to satisfy further or other environmental/emission reduction targets, this could be considered as double-counting of the same benefits. Although presently no legislation prevents such double-counting, the following legislative concepts are relevant in this regard in EU member states.

Certain financial additionality is regulated in EU member states. They need to make sure that the same reductions are not sold under GIS that would already take place with the support of other EU funding. In the case of the EU Structural Fund, EU Regulation 1083/2006 – directly applicable in all EU member states – sets out legal additionality requirements, expressing that the same environmental achievement shall not receive financial contribution under different legal rights, or the state government shall not use the same reduction under different legal titles for collecting money. Infringement of this rule can lead to infringement procedures against the member state in question under general EU legal rules. However, emission reductions above legally mandated levels might be triggered with additional funding, if there are no specific requirements for such in the given EU-funded support scheme.

Even though there are no double-counting guidelines in relation to GIS and the EU ETS, under the objective of the Community Guidelines on State Aid for environmental protection (to ensure that state aid measures will result in a higher level of environmental protection than would occur without the aid), additionality should be ensured.

This additionality requirement may thus implicitly imply in EU member states that some double-counting guidelines will have to be developed and taken into account in relation to EU ETS installations, making sure that they do not receive GIS funds for the same emission reduction.

As far as climate additionality is concerned, the Hungarian GIS follows the following approach. While it prioritises investments that receive co-financing

from other sources, the additionality is assured through a mark-up scheme as other sources of financing are not triggering higher than legally required carbon-efficiency. To illustrate this for buildings, GIS provides financing for retrofits or new buildings that demonstrate additional efficiency improvements to very low specific energy consumption levels that go beyond the levels promoted by present incentive structures. The implementation is through a labeling scheme that is related to the one mandated by the EPBD (for details please see the Hungarian case study).

Therefore, climate additionality can be guaranteed by the setup of the scheme rather than on a project-by-project basis.

3.5.4 Greening ratio

Greening ratio can be defined as the proportion of emission reductions accruing from greening activities to the amount of AAU transferred in exchange of the funds channeled to these activities. The notion of greening ratio mainly pertains to hard greening as the latter implies that AAU revenues are invested into projects with measurable and verifiable emission reduction. However, buyer countries do not seem to insist on a high greening ratio as long as emissions accounting and verification are implemented according to the agreement between a seller and a buyer and regular reports about the greening activities are produced. Nonetheless, buyers might insist on a higher greening ratio in order to increase their bargaining power.

Moreover, if a rigid quantified ratio is set selling countries will first go to the most cost-effective areas and to projects where emission reductions are easy to calculate and verify, which are often the areas where sustainability is least ensured. In addition, it will result in higher transaction costs. Thus greening ratio is not employed as a standard to regulate greening activities.

While on one hand a compromise in the greening ratio may question the effectiveness of the greening, on the other hand it also provides an opportunity to overcome a failure of other carbon instruments and policies. A flexible greening ratio, with efficient governmental management, accommodates mitigation activities that generate emission reductions in the long-term, and that are very likely not to be captured by markets or policies in the pipeline in the near future – i.e. ones that are not bankable under JI or other policy frameworks.

3.5.5 Project vs. program based approach

A project approach means the greening activity of the GIS is a stand-alone project, or a bundle of very similar projects, with a clear cut project boundary.

And it usually has a clearly defined and clearly identified emission reduction activity.

A programmatic approach means greening activities with a discrete nature, dispersed but in a great aggregate number. For example, the lighting sector modernization, and energy efficiency standards in appliances. A large number of similar activities by its nature requires larger transaction costs, but careful exploitation of the similarities of the activities in the monitoring framework of the GIS can reduce this disadvantage.

The choice between project and program based approach is also connected to the baseline setting, verification and monitoring process, as discussed in the following section and varies in attractiveness depending on the type of emission reduction activities.

3.5.6 Monitoring and verification issues

The eligibility criteria of the IET are similar to those of Track-1 JI. Under Track-1 JI, the monitoring and verification process does not necessarily follow that of the CDM and Track-2 JI, in which the verification is done by a third party. However, the host country of Track-1 JI can verify and monitor the project according to nationally developed guidelines. In the case of GIS, one of the choices is to apply Track-1 JI monitoring and verification procedure as a reference. As discussed in the rest of this report, such a choice has important drawbacks, and most countries developing GIS at the moment, such as Romania and Hungary, are opting for not adopting JI regimes.

As identified by Vayrynen and Lecocq (2005), in Track-1 JI the validation, verification and monitoring processes are all delegated to the host country, which leaves a major opportunity for discrete verification and monitoring. They further identified that the verification and monitoring process is thus divided into three different types according to different nations' position on holding excess AAU and position in participating in the EU ETS:

- a) Standard baselines and multi-project emission factors for technologies or sectors: In this case, the hosting country could set a standard baseline for a certain technology or sector;
- b) Sectoral baselines: This approach to a baseline calculation is grounded on shifting the focus of monitoring and verification "from a project-by-project level to a sector-wide level" in which case GHG emissions will be considered to originate from "a range of sources defined as a sector" (Baron and Ellis, 2006).

- c) Domestic version of internationally approved Track-2 JI methodology: In this case, the national authority adopts the methodology and other guidance for validation, verification and monitoring approved by the JI Supervision Committee, but the implementation within the national boundary must be done by the national authority of the hosting countries;
- d) Negotiated baselines: The baseline and monitoring system would be based on the negotiation between buyer and seller on a case-by-case or project-by-project basis.

These three categories of baseline setting, verification and monitoring process could be used identically under the GIS process.

In the interviews, most potential buyers suggested that for stand-alone projects, a domestic version of the CDM and JI methodology should be applied or a simplified methodology, such as sectoral default baseline could be used. For programmatic projects, it would be more flexible. For the verification process, most buyers currently do not have a concrete idea on how it should be. But a verification process and the reliability of the process are definitely important and crucial.

3.5.7 GIS timeframe and crediting period for projects

The World Bank study (2004) indicated that the GIS could be different from conventional project-based flexible mechanisms as AAU deals are more open-ended in terms of the greening activities' timeframe. A crediting period is defined as the time span during which a project generates carbon credits and which cannot exceed the project's lifecycle period (Point Carbon, 2008). Although in GIS there is no strict "credit generation" since the individual AAUs sold do not have a direct correspondence with the emission reduction activity, a loose interpretation of the term based on usage for JI is still important. JI distinguishes between:

- i. Early crediting: Early crediting is defined as the greening activities that took place before 2008. The emission reduction is then transferred and recognized as happened in the 2008-2012 period credited as AAU. This requires the acceptance of an ex-post approach and thus violates the principle of additionality.
- ii. Standard crediting period: the reduction activity is realized in the first Kyoto commitment period – between 2008 and 2012.
- iii. Late crediting: same as the mechanism above, but the greening activities take place after 2012, requiring an ex-ante crediting approach. For each ton

of CO2 equivalent reduced after 2012, the host country awards one AAU from the first commitment period.

The repercussions of limited crediting periods arouse increasing concerns of JI developers and buyers, as the lifespan of Joint Implementation projects is confined to the first commitment period. This fact limits the involved parties to a selection of large-scale projects with a high marginal profit ratio. Thus many potential projects that are characterized by long-running implementation and significant accumulated emission reductions are frequently not considered by a buying party (Korpoo & Gassan-zade, 2008). In GIS, the duration of the crediting period, potentially applicable co-funding, and the expected greening ratio jointly determine the cost-effectiveness limit under which projects are financially viable from the GIS revenues. Since important GIS target areas highlighted in this report may have long payback times and large investment requirements, this composite result (i.e. what payback time projects are financially viable under GIS) is pivotal. For instance, low-energy retrofits of old building stock will only happen if the scheme accommodates projects with very long payback periods (i.e. have either a long crediting period, or co-funding, or a low accepted greening ratio, or a combination of these). As the report argued above, for long-term climate optimality, GIS should support very low energy-level retrofits (perhaps complying with the passive-house standard). However, these investments have even longer payback times than standard retrofits, therefore **it is pivotal for GIS schemes to accommodate investments with very long payback times**. This is also well in line with additionality requirements.

In this respect the fundamental question might be whether GIS can accommodate longer crediting periods. For this a mutual consent of the seller and buyer is necessary. Recent events show that as time is running short, buyers are becoming less reluctant to accept longer crediting periods despite the post-Kyoto uncertainty and institutional imperfections of AAU sellers. The latter issue is caused by possible political instability, fraud, higher delivery risk and general uncertainty in reliability of undertaken policies, which might scare away potential buyers.

The AAU deal between Hungary and Belgium, which is using a crediting period until 2020, is likely to set the stage for further transactions. Such longer term crediting periods are justified only in cases where emission reduction will certainly and predictably occur as result of the investment and as long as the given measure is additional (ie. the same level of efficiency is not required by law). For the Belgian-Hungarian deal this is ensured because the greening is focusing on buildings carbon-efficiency where intervention measures are having long-lasting effects.

In addition to the crediting period, another important decision remains with regard to GIS timeframes. **If greening activities cover more complex areas than other mechanisms of carbon finance, fund disbursement and administration can present serious bottle-necks for the magnitude and effectiveness of GIS schemes in general.** This is compounded by the general challenge of initiating and starting up a new scheme and financing mechanism that all require time for a full-volume operation. This is especially the case for schemes that have a bottom-up disbursement approach, i.e. those that require projects to be initiated and proposed by investors.

This means that **if all aspects of GIS need to be completed by the end of the first commitment period, i.e. including the disbursement of the revenues, this substantially strengthens the risk that the revenues cannot be spent in an otherwise optimal way.** Therefore, it would be important to allow post-2012 disbursement, although this is typically not acceptable for the buyers. A possible extension to the first Kyoto commitment period can be that Kyoto Parties are allowed to settle their emission balance with Kyoto emission right units until the middle of 2014. This might allow some flexibility in the 2012 end-date in disbursements. Further disbursement of the funds after this period is also possible, but necessary safeguards for fund management need to be worked out.

3.5.8 Fund allocation

Fund allocation is defined as the way to allocate the funding in a GIS fund to the beneficiaries. Stoyanova (2006) has indicated several ways of the fund allocation:

a) Grants; b) Soft loans; c) Credit guarantees: Guarantees for credits granted by other institutions; d) Equity for projects: GIS finances projects, taking an equity share and a corresponding share of the revenues.

Credit guarantees mean that the GIS is provided as a credit guarantee for green projects when they are applying for a bank loan. When the project developer pays the loan back to the bank, the GIS funding can be returned from the bank or used as credit guarantee for other projects.

The option “equity for projects” is similar to a carbon fund in that the money is invested into greening projects, and the greening projects will later be sold to the market and will generate profit. And the GIS management body can get the funding back and share some of the profit from the greening projects.

It is also an important question whether new funds/institutions will be set up for GIS management. While a streamlined and GIS-tailored setup is probably the

most ideal, the short timeframe remaining, the short window of GIS, and the substantially increased transaction costs and startup risks imply that leveraging existing funds and organizational structures as much as feasible and sensible is important for an optimized GIS.

Another issue limiting the scale of GIS operations is the limited capacity to disburse funds efficiently. There are limits of such disbursement capacity both by the disbursing agency's capacity and by the uptake capacity of the target sectors. Such limits pose serious threats to GIS, especially with time running and the window for GIS schemes to be set up and revenues to be disbursed slowly closing. Each financing scheme and new instrument requires a pilot and a learning period, as well as one during which the awareness, experience and trust in the scheme accumulate, thus there is always a run-up phase. While money can always be spent in short periods, maximizing the benefits of GIS for the climate and society requires a profound preparation and careful launch. If GIS funds in the end cannot be disbursed for the activities and in the way regulated in related legislation and agreements, for instance due to the lack of qualifying applications, this will seriously undermine the effectiveness and credibility of GIS. **Therefore, beyond an optimized GIS architecture, the administration of the initial phases of its operation is also crucial, in order to ensure maximized disbursement towards the goals of the schemes.** Therefore, only conscious and targeted efforts can increase and ensure the scale of disbursement needed for a large impact within this short time-window available¹⁶.

Finally, fund allocation may raise the issue of breaching the state/EU aid rules and may be considered as subsidies to the invested area. How the subsidies issue interrelates with GIS especially in the EU member states and how it affects the fund allocation will be discussed in later sections.

3.5.9 Beneficiaries

The following categories of beneficiary could be identified from previous sections:

- Private companies;
- Non-profit organizations;
- Central and local authorities;
- NGOs;
- Physical persons (under limited circumstances);
- Government owned/municipally owned companies.

¹⁶ Another solution to this problem would be if the disbursement of GIS revenues were not constrained until 2012, but presently this is not likely as buyers are not open towards such an option.

The beneficiary of the GIS funding is also related to the state aid issue, which is further analyzed in Annex 2.

3.6 Summary of the key architectural modalities in GIS

Table 5 summarizes all the modality elements and modality options for GIS. The table serves as a template to identify the major issues in GIS structure. The table was used as an analytical framework to design the survey and in later sections of this report to assess GIS developments and their effectiveness for various target areas.

Table 5. Key GIS modality elements and options

| Modalities | Design options | Explanations |
|--|---|---|
| How is the money earmarked? What is the budgetary option? | State consolidated budget | The money goes to state budget and is consolidated with other funding. Allocation is made to the areas predefined in AAU sales. |
| | State special budget | Money goes to a special budget without consolidation. |
| | Extra budgetary fund | Money goes directly to a special fund. |
| Type of greening | Hard greening | GIS funding invested in projects with quantifiable emission reduction |
| | Soft greening | Funding to an area with non-quantifiable emission reduction |
| | Mixed | If mixed model is to be chosen, the key question will be how to decide on the ratio between the two. |
| Greening ratio | | The ratio of emission reductions accruing from greening activities to the amount of AAUs transferred in exchange of the funds channeled to these activities |
| Additionality | Legal additionality | There is no obligation under law to materialize the project/investment |
| | Financial additionality | There is no double support for the same emission reduction |
| | Environmental/Climate additionality | New environmental/climate benefits will arise |
| Crediting period | First commitment period | Emission reduction from the GIS investment is monitored and accounted for only during 1 st commitment period |
| | Extends beyond the first commitment period | Emission reduction from the investment is monitored and accounted for beyond 2012 |
| Policy/program approach vs. project approach | Project approach | Stand-alone project, with a clear-cut project boundary |
| | Policy/program approach | Greening activities with discrete nature, dispersed but in great aggregate number |
| | Combination | Combined project and programmatic/policy approaches |

| Modalities | Design options | Explanations |
|---|---|--|
| Fund allocation | Grants | Amount corresponding to the quantity of reduced emissions |
| | Soft loans | Loans with below-market interest rates & longer repayment periods |
| | Credit guarantees | Guarantees for credits granted by other institutions |
| Beneficiary | Private firm; NGO; Central or local government; Physical persons; Government owned/ municipally owned companies | |
| Timeframe of the GIS | Standard crediting | The greening activities take place between 2008 and 2012. |
| | Early crediting | Early crediting is defined as the greening activities could happen before 2008. (violating additionality) |
| | Late crediting | The greening activities take place after 2012. |
| Monitoring and verification of the GIS greening activities | Intervention type baseline | Baseline is established according to the type of emission reduction intervention among given circumstances |
| | Sectoral standard baselines and multi-project emission factors | A baseline calculation is grounded on shifting the focus of monitoring and verification “from a project-by-project level to a sector-wide level”; GHG emissions are considered to originate from “a range of sources defined as a sector” (Baron and Ellis, 2006). |
| | Domestic version of internationally approved Track-2 JI and CDM methodology | CDM and JI methodology, verified not by third party but by the hosting country |
| | Negotiated baselines | Buyers and sellers negotiate the baseline by each transaction |
| Project selection process | Top-down | National priority area, depends on government decision, through regional or sectoral distribution |
| | Bottom-up | Open application procedure where additionality and emission reduction potential decide priorities |

3.7 Issues influencing the design of GIS architectures

3.7.1 Risks of GIS and their impacts on modality

Risks in GIS are not modality elements. However, risks have an impact on the GIS modality design. To hedge the risk, the modality has to take the risks into consideration and make relevant arrangements.

Similar to any other carbon finance mechanism, GIS does incur some risks. The following risks have been identified by various literatures. Vayrynen and Lecocq (2005) have categorized them as following:

- i. Greening activity delivery risk: this is related to the greening projects not being implemented or the money not channeled to real greening activities but used for other purposes (risk to be mitigated by verification, monitoring, additional contract requirements between seller and buyer);
- ii. AAU transferability risk: The AAU transferability risk was of concern in the last years, as some of the AAU sales agreements have been signed in the form of MOUs even before the selling country had a GIS in place and the eligibility criteria were met for the selling countries to participate in the IET. In addition, the Marrakesh Accords regulate that ERUs or AAUs cannot be used by a Party to meet its targets under the Kyoto Protocol in case a participating country's compliance is in doubt (Marrakesh Accords, 2001). All potential GIS host countries except Bulgaria are currently eligible (UN Compliance Committee 2008).
- iii. Risk over the AAU management of the selling country: There is a risk that there will be an oversell of the AAUs and shortfall in 2012, which is mainly caused by the mis-management of the AAUs or an unpredicted increase in the national emissions due to reasons like economic recovery. Taking this risk into account, the selling country needs to make sure it only sells AAUs above its' Kyoto target, AAUs that are not used in the EU ETS (in case applicable), or for JI projects (in case applicable).
- iv. Price risk: the price fluctuation of the carbon market, and the dynamics between the Kyoto-related carbon market and regional carbon markets, such as EU ETS.
- v. Environmental credibility of the greening: this is likely to arise where there is a lack of additionality criteria, third party validation, verification and transparency.

Table 6 identifies different risks in the Kyoto flexible mechanisms, while the table in Annex 3 discusses the impact of risks in GIS on modality design. The labels in Table 6 (+, 0, –) weigh the cumulative risk in the different categories. It represents a qualitative assessment showing the relative risk factors involved in different flexible mechanisms.

Table 6. Risks pertaining to flexible mechanisms of Kyoto Protocol¹⁷

| Mechanism – in general | JI | CDM | GIS |
|--|----|-----|-----|
| The buyer faces and perceives the following main risks: | | | |
| (i) <i>Delivery risk</i> : that the Seller fails to deliver the units it has contracted to deliver (e.g. because it has overestimated its supply, because it no longer wishes to respect the contract, because of dispute, eligibility etc.) | - | 0 | + |
| Inability to deliver | - | - | + |
| Deliberate or negligent non-delivery | 0 | - | + |
| Force majeure | - | - | 0 |
| Remedies | 0 | - | + |
| (ii) <i>Greening risk</i> : that commitments to greening are not fulfilled, which results in the units being less valuable than anticipated by the buyer | 0 | 0 | + |
| (iii) <i>Political risk</i> : that the transactions entered into are not acceptable politically (e.g. because taxpayers are not convinced by greening commitments) | + | + | 0 |
| The seller faces and perceives the following main risks: | | | |
| (i) <i>Compliance risk</i> : that it commits to sell more units than it actually has free for sale | 0 | 0 | + |
| (ii) <i>Greening risk</i> : that it commits to delivering emission reduction but proves unable to ensure enough “greening” actually happens | 0 | 0 | 0 |
| (iii) <i>Counter-party risk</i> : that a counter-party to which it sells units fails to make payment for the units or is not eligible to receive units | 0 | 0 | + |
| (iv) <i>Political risk</i> : that negative political reaction occurs (for example in the event of an increase in prices following a fixed price sale) | + | 0 | - |
| (iii) Portfolio over-exposure | 0 | - | + |

¹⁷ GIS can different magnitudes and types of risks, depending on its architecture. This table has been constructed based on the Hungarian GIS architecture.

| Other risk considerations: | | | |
|---|---|---|---|
| (i) Market risk: Price fluctuations | 0 | 0 | + |
| (ii) Advance payments and risk management | - | - | + |

3.7.2 Interaction with other legislation

This report has discussed the issues of eligibility criteria for EIT under the KP, with more details in Annex 1 on ramifications of the ETS and state aid legislation in EU member states, and some other legal interactions. This section provides further details on some legislative frameworks through which GIS activities are affected.

Most of these pertain to EU member states. Here certain financial additionality is legislated through Art. 15 of Regulation 1083/2006 (EC 2006), that underlines that structural funds need to be additional to other aid (thus in EU countries it has to be made sure in order to avoid infringement procedures that the project/investment will be new and not an already existing, EU-founded environmental project). Furthermore, Art. 55 of the Regulation on revenue generating is also directly applicable for EU member states, implicitly stating the need for financial additionality in relation to structural funds and other funding options.

Annex 2 provides details on another important area where there is interaction with legislation in the EU: State Aid rules pertaining to environmental aid affecting the GIS.

3.8 Lessons learned from the experiences with CDM/JI

The purpose of this chapter is to review the lessons learned from the other flexibility mechanisms of the Kyoto Protocol in order to benefit the design of GIS. The section reviews the modalities of CDM/JI and their implications on climate and sustainable development effectiveness, and identifies where the GIS could avoid similar pitfalls. The Kyoto Protocol's project based flexible mechanisms are reviewed in terms of their development, constraints, and shortcomings resulting from their modalities. The purpose is to review the problems with these two carbon mechanisms that already have some track record and to see what GIS can learn from these experiences. The main question is whether GIS is able to overcome some of the key challenges of CDM/JI and to unlock more substantial emission reduction potentials in fundamental areas of climate

change mitigation in the GIS host countries, while promoting sustainable development.

3.8.1 The development of the project-based flexible mechanisms

So far, CDM has become one of the most sophisticated and mature mechanisms on the carbon market, with experiences gained and lessons learnt to be used for the design of other new carbon finance mechanisms. The CDM modalities, methodology and project cycle are now “copied” to Track-2 JI. Thus, the conclusion from the analysis of the modality of CDM and its constraints can also be applied to JI.

In recent years, there have been some new developments of CDM and JI taking place. The programmatic approach (hereafter: pCDM) was introduced, trying to capture the projects with dispersive nature, like EE and small scale RE projects. GIS priority areas as well as the design of the modality of GIS are similar to those under pCDM. However, the pCDM is not experiencing a boom as expected. It would be interesting to analyze the problems in the pCDM and to see whether GIS could better accommodate a programmatic approach. In this part, the discussion therefore focuses on the CDM/JI: modality design, the successes and pitfalls, and the pCDM.

3.8.2 Constraints of the CDM and JI

By November 2008, there were 4,257 projects in the CDM pipeline¹⁸ (UNEP 2008). The Marrakesh Accords, adopted at the COP-7, set up the basic modalities for the CDM development. CDM started immediately after the entry into force of Kyoto Protocol in 2005. Projects starting in 2000 and later are eligible to earn Certified Emission Reduction (CERs). All these conditions provided the CDM a unique opportunity. JI started in January 2008, with the start of the first commitment period. As of November 2008, there were only 179 projects in the pipeline: 17 JI-Track1 projects and 162 of JI-Track2 (UNEP 2008). As mentioned at the beginning of this chapter, JI is now copying the project cycle and the methodology from CDM. Therefore in this section, we mainly review the lessons learnt from CDM that are relevant for the design of GIS.

As indicated in the Kyoto Protocol (1997) and reiterated in the Marrakesh Accords (2001), CDM should lead to real, measurable and long-term GHG

¹⁸ Pipeline is defined as the course of projects from the validation stage, through registration and insurance of the Certified Emission Reduction (CER).

reductions which are additional to a baseline scenario in the absence of the CDM project. The CDM project cycle is developed to ensure these concerns are met, introducing the environmental safeguards, through measures including third party validation and verification, the approval of issuances of CERs by the Executive Board, public participation, the strict baseline setting and methodologies, and monitoring plan.

The foremost problem of CDM is the failure to fulfill the sustainable development goal. The criteria for judging the sustainable development are under the control of the host country, and are not guided by any international regulations. At the same time, around 29% (UNEP 2008) of the CERs to be issued in 2012 in the current pipeline are from industrial gas flaring projects, whose environmental integrity and contribution to sustainable development is debatable (Hinostroza et al. 2007; Michaelowa 2005). In case individual GIS also aim to embrace goals related to sustainable development broader than just GHG emission reductions, it is therefore important to examine whether it is sufficient to leave the implementation of this goal with the host. In case of CDM projects, fulfillment of sustainability criteria can bring a price bonus. With similar logic, GIS activities with sustainability benefits can attract a higher price, thus motivate seller countries.

According to experiences to date, the modality design as well as the other features of the CDM jeopardise the effectiveness of CDM funds to be channeled to the areas where significant emission reduction could be generated, such as energy efficiency in the building sector. Many of these projects would also be associated with the most significant sustainability benefits by involving local communities to a large extent, such as measures in households or small businesses. Meanwhile, the project-based characteristic of CDM blocks the funding to be channeled into the basic sectoral infrastructural construction in developing countries, which may have a lock-in effect on GHG emissions in decades to come (Figueres 2005, 2006).

CDM has some other constraints in addressing deeper and broader emission reduction opportunities, and these are reviewed in the following sections.

3.8.2.1 Additionality

Additionality ensures the project is happening additionally to the business-as-usual scenario (BAU). However, additionality caused the problem known as “the perverse incentive”, which means that the developing countries do not have an incentive to develop climate-friendly policies, as it might set hurdles to prove the additionality of the CDM (Figueres 2006; Michaelowa 2005).

In 2005, the CDM Executive Board (EB) has adopted a decision to correct the effect of “perverse incentive”, by including the E+¹⁹ policies implemented after 1997 and E-²⁰ policies implemented after 2001 into the baseline scenario (EB 2001). The decision is effective in eliminating the adverse effects to hosting countries in adopting new climate-friendly policies, but it is still not sufficient to encourage the hosting countries to be active in adopting policies for decarbonization (Hinothroza et al. 2007). At the same time the additionality approval or assessment still poses huge barriers to the Energy Efficiency (EE) project development in CDM, which will be discussed later.

3.8.2.2 Improved energy efficiency in CDM

Recent studies demonstrate that demand-side energy efficiency has the single largest cost-effective potential for GHG mitigation (Figueres and Philips, 2007; Chia-Chin, 2005; Klessmann et al., 2007). However, in the current CDM pipeline, the EE projects, both EE supply and EE demand, comprise only a share of 14.5% of the total project number (UNEP 2008). For JI, EE projects demonstrate only 18% of the total project number (UNEP 2008).

The reason for the lack of EE projects in the CDM project stream is multifaceted, such as split incentives for energy saving, monitoring difficulties, buyer’s preferences towards EE CDM projects are lower, etc. (Hinothroza et al. 2007). Among all these reasons, one of the major reasons lies in the lack of methodology for EE CDM projects. The incompatibility between the nature of EE projects and the basic modality structure of CDM is one of the major reasons for the limited number of methodologies approved for EE projects (Hayashi and Michaelowa 2007; Hinothroza et al. 2007).

Hayashi and Michaelowa (2007) explained the major reasons for rejection of EE related new methodologies as follows. First, some new EE methodologies are based on the empirical analysis between the emissions and procedural changes, which is different from the traditional methodology that is based on the technology approach, hence was rejected by EB. EE projects always require a broader approach, which includes multiple procedures in one project. However, this is not a common process accepted by the EB currently. Secondly, the baseline approach is not diversified enough to accommodate different EE project types. Third, for EE projects it is difficult to pass the additionality assessment due to the economic viability of EE projects themselves, if only direct costs are considered without transaction costs. Fourth, it is difficult to calculate the emission reduction from EE projects. Table 7 summarizes the barriers to the approval of EE methodologies.

¹⁹ E+ policies are those, national and/or sectoral policies or regulations that give comparative advantages to more emissions-intensive technologies or fuels over less emissions-intensive technologies or fuels. (EB 2001)

²⁰ E- policies are those, National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs). (EB 2001)

Table 7. Barriers for EE methodology approval

| | Conventional approach of CDM | EE methodology barriers |
|---|---|--|
| Applicability: methodology to define proceedings which are directly applicable to project activities | Technology based; bottom-up approach | Employ an empirical approach, performance parameter or benchmarking and facility-level-bundling approach |
| Baseline approach | Historical baseline; emissions of an economically attractive course of action; taking into account barriers to investment | The different categories of EE are difficult to be fit into the clear-cut baseline |
| Additionality analysis | Investment analysis; barrier analysis | Investment analysis not easy to be approved |
| Emission calculation | | Difficult to address the issue of capacity expansion; rebound effect; endogenous EE improvement |

(Adapted from Hayashi and Michaelowa. 2007; Muller-Pelzer and Michaelowa. 2005)

3.8.2.3 Limited options for CDM/JI land-use projects

The scope of land-use projects under CDM and JI currently is limited. At the Seventh Conference of the Parties to the UN Framework Convention on Climate Change (COP-7) in 2001 in Marrakesh, Parties agreed in principle to allow afforestation and reforestation projects (“A/R projects”) on land that has been non-forested since at least 1990 in the CDM. The use of credits generated by such projects was capped at the equivalent of one percent of any industrialized country’s 1990 emissions for the first commitment period²¹. CDM AR projects create temporary credits. A main problem for potential buyers of CDM AR credits is the temporary nature of these credits. The buyer has the responsibility for the replacement of these credits if they expire or when the sequestered carbon is lost.

While under the CDM only afforestation and reforestation projects (“A/R projects”) are permitted, under JI it depends on which additional activities the host country has selected under the Kyoto Protocol’s article 3.4 (Article 3.4 activities are forest management, cropland management, grazing land management and re-vegetation). ERUs can only be issued for those activities

²¹ See Decision 17/CP.7, Modalities and procedures for a clean development mechanism. UN Doc FCCC/CP/2001/13/Add.2

that a host has elected to account for. In contrast to the CDM, JI land-use credits are permanent as projects are undertaken only in countries that have to meet a GHG target, the problem of non-permanence is addressed by the complying Party (Tuerk et al 2008).

Other barriers specific to CDM/JI land-use projects are the need for large upfront investments and long crediting periods which lead to a delayed rate of return. Trees need several years to grow until they can generate a significant amount of credits.

3.8.2.4 Transaction cost

Due to the lengthy procedure of the project cycle as well as the high specific M&V costs, the transaction cost is a major barrier to CDM projects. It has been estimated that for a small scale CDM (SSC) project, 2-15% of the total capital cost is transaction cost, while a large project has 0.2-0.3% of the capital cost for transaction costs (ADB 2003). Michaelowa and Jotzo (2005) estimated the transaction cost in combination with the project size. For the very large projects with annual reduction of 200,000 ton CO₂ e, the transaction cost could be €0.1/ton. Small projects, with 2000-20000t CO₂ e/yr, have a cost of €10/ton. If a new methodology is submitted along with a new project, the transaction cost for the new methodology approval is even higher. Currently, the CDM market price is about €16/ton, so it is obvious that the small projects are not viable in the market, while most energy-efficiency projects fall into this category.

These facts indicate that the small scale CDM is less favorable and less profitable than large scale projects. However, the SSC projects may have significant potential for emission reduction and contribution to sustainable development, as most of the energy efficiency projects in demand side management are small-scale and disperse in nature. These projects do not get prioritized in CDM/JI and the high transaction cost is one of the major reasons which contribute to this phenomenon.

3.8.3 Programmatic CDM (pCDM)

Programmatic CDM (pCDM) has been proposed together with policy CDM and sectoral CDM as a way to reform the current project based, stand-alone CDM. It was seen as an innovation of the CDM to better address CDM's operation in a number of areas. Among others, it is intended to facilitate CDM's effectiveness for investments that are composed of a large number of small to medium sized projects which are geographically dispersed and occur over a period of time, such as in the case of end use EE (Hinostra et al. 2007), which are not feasible under traditional CDM.

At the Conference of the Parties serving as the meeting of the Parties in 2005 (COP11/MOP1), programmatic CDM was adopted as a new form of CDM. Policy CDM and sectoral CDM, however, have not been adopted yet under the UNFCCC. Before introducing the pCDM, sectoral CDM and policy CDM should be briefly described and their difference with the pCDM be addressed.

Policy CDM is defined as a deliberate government policy, measure or standard that leads to emission reduction in one or more sectors (Figueres 2005, 2006; Samaniego and Figueres 2002). The sectoral CDM (S-CDM) was proposed originally to overcome the perverse incentive created by the additionality principle in CDM (Figueres 2005, 2006).

There is still no uniform definition of sectoral CDM. For example, sectoral CDM has an overlap with policy CDM in that it targets a sector by implementing a series of measures for emission reductions (Bosi and Ellis 2005). Also programmatic projects may implement policies, measures and stated goals if there are barriers to their implementation (UNFCCC 2007b), so there is also an overlap with policy crediting (Sterk, 2008).

However, what is different is the intermediary of the projects. Intermediary for policy CDM is always a government or the public sector, while the intermediary for sectoral CDM is usually a private organization (Hinojosa et al. 2007). In terms of the intermediary, pCDM can be coordinated by both public and private entities.

The COP11/MOP1 defines pCDM as

...a local/regional/national policy or standard that cannot be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity...
(UN DOC. 7/CMP.1, paragraph 20. 2005)

The UN CDM Executive Board adopted guidelines for programmatic CDM at its 32nd meeting in June 2007²².

According to the EB guidelines a programme of activities (PoA) is a voluntary coordinated action by a private or public entity which coordinates and implements any policy/measure or stated goal (i.e. incentive schemes and voluntary programmes), which leads to anthropogenic GHG emission reductions or net anthropogenic greenhouse gas removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM programme activities (CPAs). CPAs must comply with all

²² EB 32, Annex 38

procedure and modalities of the CDM (Hinostra et al. 2007), however they can occur either simultaneously or throughout the duration of the program. CPAs can be added to the program at any time. They can occur in multiple sites also in more than one country. In contrary to a bundling of activities, there is no ex-ante identification of the project sites. Only the entity implementing the program represents the project activity and not every project participant. The actual reductions are verified by sampling. All CPAs of a PoA have to apply the same approved baseline and monitoring methodology, involving one type of technology or set of interrelated measures in the same type of facility/installation/land (EB, 2007).

More than a year after the agreement on the rules however, only four CDM programmes (PoAs) have been submitted and not a single one registered (Point Carbon, 25.09.2008). Reasons include the liability of validators for an erroneous inclusion of CPAs in a PoA²³, the limit to one methodology and one technology, high upfront work to guarantee high CER volumes and the starting date of the PoA²⁴ (see UNFCCC 2008 submissions on p-CDM such as IETA 2008, Climate Focus 2008).

However, most of the EE related projects involve multiple procedures or multiple projects, which require several methodologies or a facility-level-bundling methodology. The current PoA rules therefore preclude developing a PoA out of a buildings energy efficiency policy or standard (IETA, 2008).

3.8.4 Lessons to be learned from CDM/JI for the architecture of

GIS

The discussions in this chapter attested that the architecture of the CDM and JI compromise their effectiveness in certain mitigation target areas. These areas include improvements in energy efficiency as well as other small-scale projects. The constraints were found to originate from the requirement of the additionality test, the methodology approval process, the monitoring and verification requirements as well as the high transaction costs and long approval cycle. Also the programmatic CDM, designed to overcome some of the problems related to project types that include a large number of small to medium sized entities faced prohibitive barriers so far.

²³ If a DNA or EB member has found the inclusion of a CPA erroneous, the responsible DOE should transfer an amount of Certified Emission Reductions (CERs) to a cancellation account equal to the amount already issued under the CPA.2.

²⁴ According to the UN Glossary of CDM Terms the starting date of a CPA can only be after the registration of the PoA. Starting date is defined as “the earliest date at which either the implementation or construction or real action of a programme activity begins”. This implies that project participants will lose the reductions from all installations implemented before PoA registration. The PoA deviates from regular CDM here as well (Climate Focus 2008).

In order to avoid the shortcomings of CDM to foster energy-efficiency and other small-scale projects with high sustainability dividends, the following points can be taken into consideration:

- a) The methodology for EE projects needs to be simple. Ideally, it takes into account the nature of EE projects, especially in terms of the additionality testing;
- b) The methodology for the projects needs to be diverse. For instance, a facility-level-bundling approach could be explored specifically for EE projects that allow the methodology to be set not only on a technology basis, but also for behavior change. The application of multiple methodologies allowed for projects which have a programmatic approach facilitates complex energy-efficiency projects such as in the case of buildings with multiple end-uses and technologies to cover.
- c) High transaction costs: a simple project cycle in GIS enables small-scale projects, with more money resources spent on project implementation rather than on the procedures for project development.

The purpose of this chapter was to review the lessons learnt from the CDM/JI to shed light on the optimal GIS modality design. From the findings above, the following issues need to be considered during the design of GIS architectures:

1. The additionality test has posed some major constraints on CDM and Track-2 JI towards addressing emission reduction in energy efficiency. Therefore, additionality requirements for GIS need to be set carefully, keeping in mind their potentially detrimental implications for EE and small-scale projects.
2. The methodologies used in GIS should be considered to be simpler than in CDM and Track-2 JI. GIS could consider using the methodologies for emission monitoring and baseline setting from other internationally agreed protocols rather than CDM/JI.
3. The project cycle in CDM and JI is so complicated that a significant portion of the money is spent on administrative transaction costs, making small-scale projects not financially viable. If GIS wants to mobilize energy-efficiency projects and other small-scale emission reduction activities, it needs to find an architecture that keeps transaction costs for such projects at bay and make sure that more money is spent on the emission reduction activities.
4. Monitoring and verification requirements. Since energy-efficiency projects require a complicated and expensive monitoring and verification for a

rigorous proof of emission reductions, streamlined and simplified M&V guidelines can only facilitate a GIS effective in mitigation activities with large sustainability dividends.

5. Sustainability benefits, similarly to the case of CDM can potentially attract higher prices in GIS.

Table 8 reviews the key aspects of CDM and JI (mainly Track-2) that compromise their effectiveness in emission reduction activities with highest sustainability benefits, and the implications of these for GIS modality choices.

Table 8. Summary of the lessons that can be learned from the shortcomings of CDM/Track-2 JI for GIS architectures

| Modality of CDM/JI compromising effectiveness in EE&LULUCF | Implications for GIS architectures |
|---|---|
| Strict additionality criterion | Additionality criterion to be softened in terms of monitoring requirements |
| High project transaction costs | Simpler or more streamlined project cycle |
| Difficulty in having methodologies approved | Allowing simplified, sector-based methodologies; Allowing multiple methodologies and facility-level bundling |
| Complex monitoring and verification requirements | Simple M&V, such as using sampling |
| High transaction cost of activity | Softening greening ratio or allowing longer crediting periods to improve the bankability of projects even with transaction costs; Institutional assistance in reducing transaction costs |

These findings can be used by the hosting countries as principles in developing the GIS. For buyers, the same understanding should be shared to ensure that buyers will not employ the same strict requirement in CDM and JI on GIS.

On the other hand, the selection process of the private sector may not follow the national priorities of the host country and may exclude certain areas. Experiences with land-use and energy efficiency projects show that there is almost no incentive for the private sector to carry them out under JI/CDM. As these areas have major socio-economic benefits, these are of high importance for many GIS host countries.

3.9 Why GIS rather than Track-1 JI?

Since Track-1 JI, in principle, can be very similar to GIS, the question emerges what the point is in setting up a new scheme, and why can Track-1 JI (in countries that are eligible for it) not prevent the risks associated by a potentially poorly functioning new scheme.

For New EU Member States Track-1 JI is rather disadvantaged because of the limitations posed by the Linking Directive, effectively eliminating 80% of possible investment opportunities. The EU ETS covers most of the energy intensive sectors, where no additional policy intervention is necessary. Along with this, there is a significant emission reduction potential in the building sector which is responsible for significant parts of emissions and not targeted by carbon-finance and can bring significant co-benefits along with emission reduction. A third area in national emission balances, which could attract policy intervention and funding, is a sector with dynamically growing emissions: transport. However, interventions in the transport sector are rather difficult to design and implement and expensive due to trends and interests opposite to emission reduction.

JI projects are usually promoted by carbon-market actors with shorter term financial interest, while **GIS accommodates longer-term horizons and allows governments to place emphasis on areas where early investment is crucial for the transition to a de-carbonized economy in the long-term and requires robust actions.** While JI became a cumbersome and difficult mechanism, **GIS offers opportunities for state-induced emission reduction activities which can target emission reduction areas of strategic importance.** State involvement can provide for a much larger organizational structure of program coordination than what traditional carbon-market actors are ready for, and it can also manage, with careful organization, the limitation of transaction costs, which might be prohibitive in the case of JI-type operation.

In addition, GIS offers an opportunity to implement small-sized projects as opposed to JI. While programmatic approaches can also be implemented under JI, it is unlikely that they will play a role in CEE countries, as JI is developed by the private sector which has little incentive to carry out complex project types if there is potential for more simple ones. In addition, JI is practically inoperational in EU member states due to the Linking Directive. GIS can also fund those very important climate mitigation target areas that are prohibited in JI because of their interaction with the EU ETS. Furthermore, since most countries implement their JI Track 1 rules similarly to Track 2 provisions, the freedom that a country can have under JI Track 1 in theory reading MRV cannot be exhausted. More freedom regarding MRV under a GIS can lower transaction costs and allow

effectiveness in high-priority target areas that MRV requirements of JI have severely affected. Finally, for certain project types, which need a large amount of upfront payment, a GIS can be more appropriate since GIS revenues are available prior to the investments as opposed to the typical revenue stream from JI.

4 The carbon market

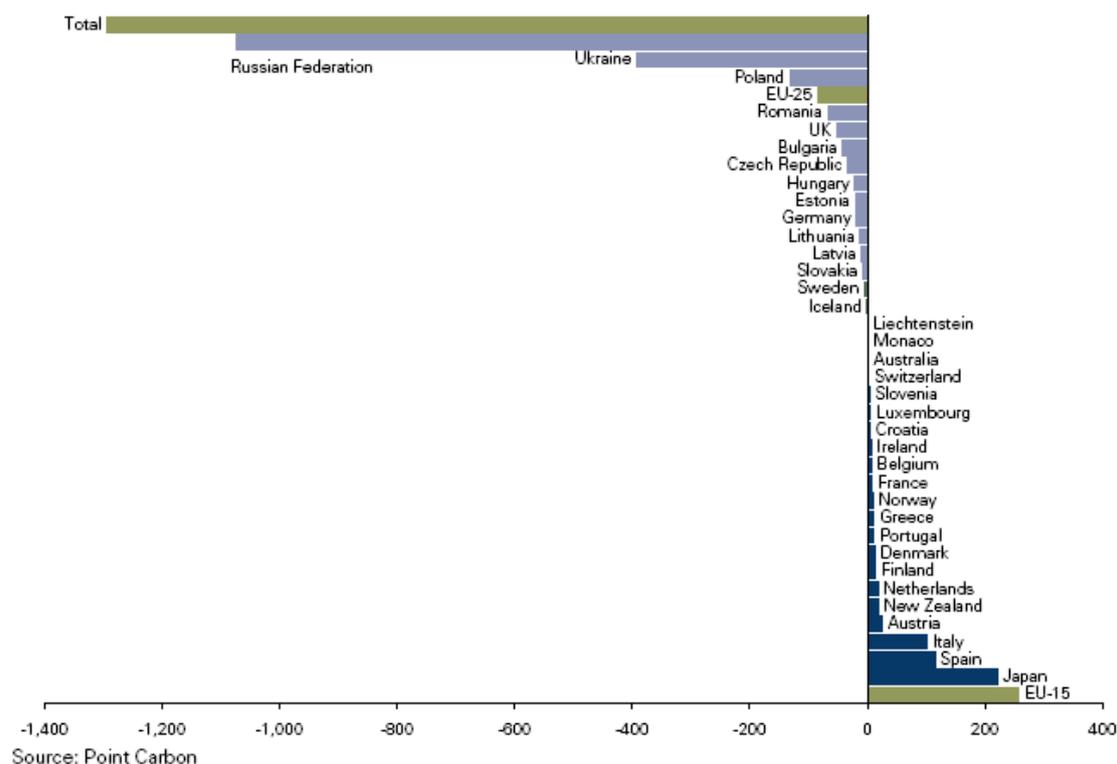
4.1 The role of GIS in balancing the Kyoto market

A recent report by Point Carbon (Point Carbon 2008c) looks into the overall supply-demand balance of Assigned Amount Units (AAUs) under the Kyoto Protocol. By comparing business-as-usual greenhouse gas emissions to national obligations set by the Kyoto Protocol, it estimates the extent to which various countries will have a surplus or deficit of AAU allowances.

Figure 5 presents the results from this study in terms of gross demand and supply. It should be noted that there is considerable uncertainty related to these estimates, as well as the estimates of net demand presented below. The gross demand could be significantly affected by future economic growth or the depth of the emerging global recession. The net demand depends, among others, on how many carbon credits national purchasing programs will be able to buy with their limited budgets, and hence depends i.a. on future carbon prices.

As the figure shows, the overall market is long by 1.3 Gt/year, summing up to 6.5 Gt over the whole five year period. The main reason for this surplus is that Russian and Ukrainian emissions are expected to be much lower than what was the case in 1990. A number of other countries also have significant surpluses, meaning, for example, that the EU27 has a surplus.

Figure 5. Gross demand-supply balance for the Kyoto market (MtCO₂e/year)



However, Figure 5 gives a somewhat misleading picture of the market situation by indicating a large supply surplus. In order to affect market and prices, the surplus will have to become available to the buyers, e.g. offered to the market. This has not happened so far and as discussed below, it is questionable to what extent it will happen.

In the outset, gross demand under the Kyoto Protocol amounts to 557 Mt/year, excluding potential demand from Canada. The countries that have a demand will try to meet this by reducing their own emissions, by the use of emissions trading schemes and direct regulations. In addition, they will buy credits from Joint Implementation (JI) and Clean Development Mechanism (CDM) projects. When we take the current purchasing programs and other actions into account, as well as the sink provisions given in Annex Z in the Kyoto Protocol, we end up with a remaining demand of some 900 Mt aggregated over the five year commitment period²⁵, see Figure 6. Figure 7 illustrates how this net demand is calculated from gross demand by taking into account the different policy actions taken to reduce AAU shortfall.

²⁵ The CDM/JI dynamics assumes a total aggregated supply of a little less than 2 Gt by Q2 2013. This estimate by Point Carbon (PC, by Kristian Tangen) is largely based on an extrapolation of current trends in the project market, using PC's forecasting framework. PC believes that this supply estimate is fairly unelastic to prices. Purchasing of individual countries is based on their announced purchasing plans.

Figure 6. Net demand and supply, after taking into account sink provisions under Annex Z in the Kyoto Protocol, planned purchases of CERs and ERUs, and domestic reduction measures such as direct control regulations and the EU ETS.

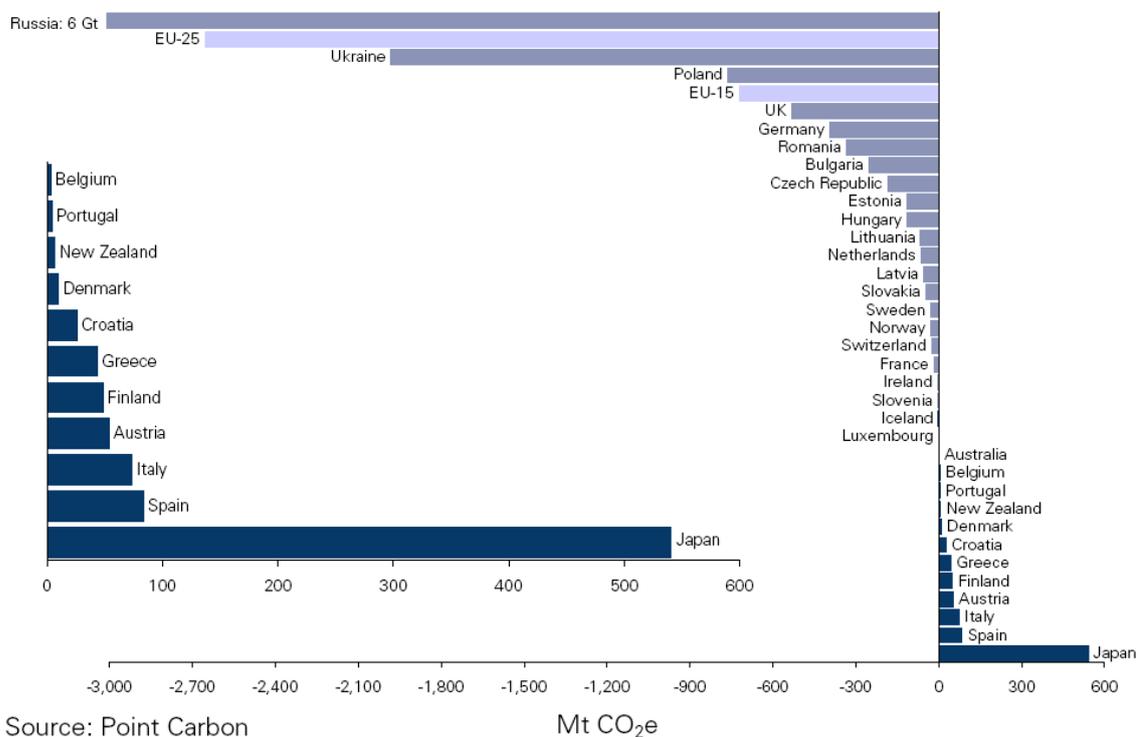
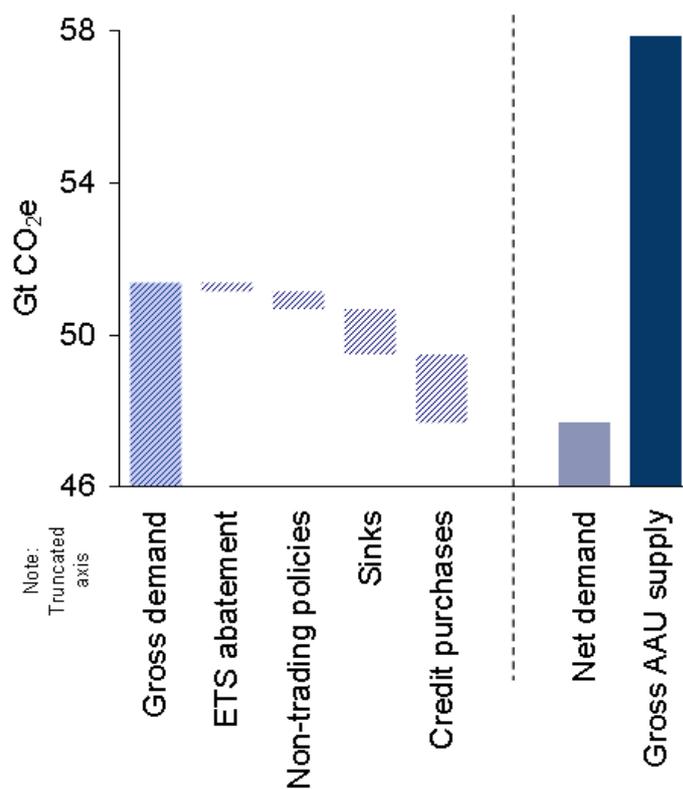


Figure 7. Gross versus net AAU demand, aggregated over all Annex I countries.



This demand will have to be met by purchasing AAUs. If we for example assume a price of €10/t, which is more or less in line with the current price level (see below), the costs involved will amount to roughly €9 billion. However, price is dependent on general carbon market prices and several other factors, thus with the increase of the price of other carbon market product, gAAUs may also have a higher price as well. According to the Hungarian experience, hard greening can in general bring 20-30 % lower price than secondary CERs, and soft greening 40-30 % below, among market conditions prevailing recently. However, the price of gAAUs is not established yet, as no information regarding price²⁶ was revealed in connection to the few current deals.

4.2 The key players on the buyer side

The status of AAU/GIS policies of potential seller countries will be addressed later in this report. Figure 6 gives an indication of the most important players on the buy side. As the figure shows, Japan is the country with the largest demand for AAUs, followed by Spain and Italy.

Japan has been one of the first movers when it comes to purchasing AAUs, and has been in discussions with quite a number of the seller countries. The Japanese players are both governmental representatives, as well as private companies. Buying AAUs is one possibility under the Japanese governmental purchasing program in which the Japanese government has been actively trying to sign AAU purchase agreements, for example with Poland (Point Carbon 2008a). From the corporate side, some companies have looked into the possibilities for buying AAUs to meet their own voluntary objectives and some financial institutions see this market as a potential opportunity for the future.

Among the EU countries, Spain, Italy, Belgium, the Netherlands, Finland and Austria have actively sought out opportunities for buying *green* AAUs. Being among the countries with largest AAU demand, might explain Spain's and Italy's interest. The Netherlands has had a long tradition of being among the first movers in the carbon market, including JI, CDM and now GIS, even though Figure 6 demonstrates that they could in principle sell AAUs rather than buy.

Also New Zealand is emerging as a potential player. Recently, New Zealand companies received the right to use AAUs for compliance under the newly introduced New Zealand Emissions Trading System (NZ ETS). Interestingly, it

²⁶ A caveat is that prices in GIS are not set by day-to-day fluctuations – as parties negotiate in a long process, where at a point an agreement on price is made. It is partly because most of the deals are set by governments with less flexibility than carbon traders.

is expected that New Zealand companies may not only act as buyers of AAUs but also as sellers. Forest owners are expected to sell some of their credits into the market. Forestry has begun to be phased into the scheme already, and is expected to cover up to 2,500 participants. Under current plans, New Zealand units (NZUs) will be interchangeable with AAUs and forest owners that have used their forests as carbon sinks will be able to sell AAUs on the international market. The New Zealand AAU price is reported at the €12-€13/tCO₂ level.

On the other hand, there is major political uncertainty about the shape and future existence of the New Zealand emissions trading scheme following the change in government. The inclusion of forestry and agriculture is a controversial aspect of the scheme's design, as is the use of AAUs (Point Carbon 2008e). The new government, led by the National party has pledged to review the ETS and may abolish it altogether.

Which seller a buyer chooses to purchase their required AAUs from is determined by many factors together. Here only one point needs to be made. As Figure 6 demonstrates, EU-15 countries account for less than one-third of the compliance gap that will likely be covered by AAUs, while EU-27 also offers less than 1/3 of potentially available AAUs to be sold, or potentially more if Russia does not establish a GIS. Total EU investments into AAUs are likely to run in the order of magnitude of €3.8-4.0 billion. If these funds are invested in other EU member states on climate mitigation, this will help the EU comply with its post-2012 commitments, reducing unavoidable investment burden within the next 8 years²⁷. **Therefore the EU might consider adopting a guideline that if price and other key criteria are equal, EU member states should place a preference on purchasing AAUs from GISs of other member states.**

4.3 Prices and price formation

These are early days for the GIS/AAU market. However, the market is starting to become more substantial. A few transactions have taken place, Memoranda of Understanding are being signed and contract templates are being developed.

Early in autumn 2008 it seemed like there would be a host of activities on GIS by the end of the year. But with the spreading financial crisis and falling carbon prices, this is no longer the case. By the end of September, AAUs were heard

²⁷ In fact, this investment in CEE MSs might bring higher financial benefits at an EU-level. If these funds support early-action type investments, such as those in very low carbon buildings, these MSs will avoid having to undergo much more expensive retrofits later when ambitious emission reduction targets are to be met. This is because a large cost in a building retrofit is not necessarily the actual efficiency measure such as the thickness of insulation, but other associate costs such as scaffolding, potentially relocating tenants, the design, and the reapplication of the finishings and decoration, etc. Thus early action for buildings is especially important to avoid later lock-in to higher carbon building stock or substantially more expensive later retrofit needs.

offered for around €10-15, while prices currently being negotiated (late October 2008) are estimated to be around €8-12. It should be noted however, that contracting green AAUs is a relatively long process and prices are not following the day-to-day fluctuation of the carbon price on stock exchanges, but reflect longer trends. Prices for hard- and soft-greened AAUs may also differ, as other characteristics of the greened AAU product also influence the final price.

In view of slumping prices, there have been reports of delays of planned AAU sales. A Czech Republic representative recently said that the country will delay the AAU auction it was scheduling for December 2008 to February 2009 at the earliest. Other deals may also be under threat as buyer countries lower their price expectations in line with lowering primary ERU and secondary CER prices, while seller countries are not yet prepared to discount.

In general, the wide spread between sellers' and buyers' expectations has been holding back the development of the market. The buyers are interested in purchasing green AAUs because it might lower their compliance costs compared to buying CERs or ERUs, decrease project related risk compared to primary products and would help to diversify their portfolio. They expect that the units will be traded at a discount compared to such credits because of more questionable environmental quality, as well as limited demand. The sellers on the other hand, tend to look at prices for secondary CERs or even EUAs and expect a price level slightly below them for green AAUs. Moreover, recent analyses indicating that carbon prices in the EU ETS post-2012 might be at the level of € 30-50/t have in some instances increased the gulf between the perceptions of buyers and sellers of what a fair price would be today.

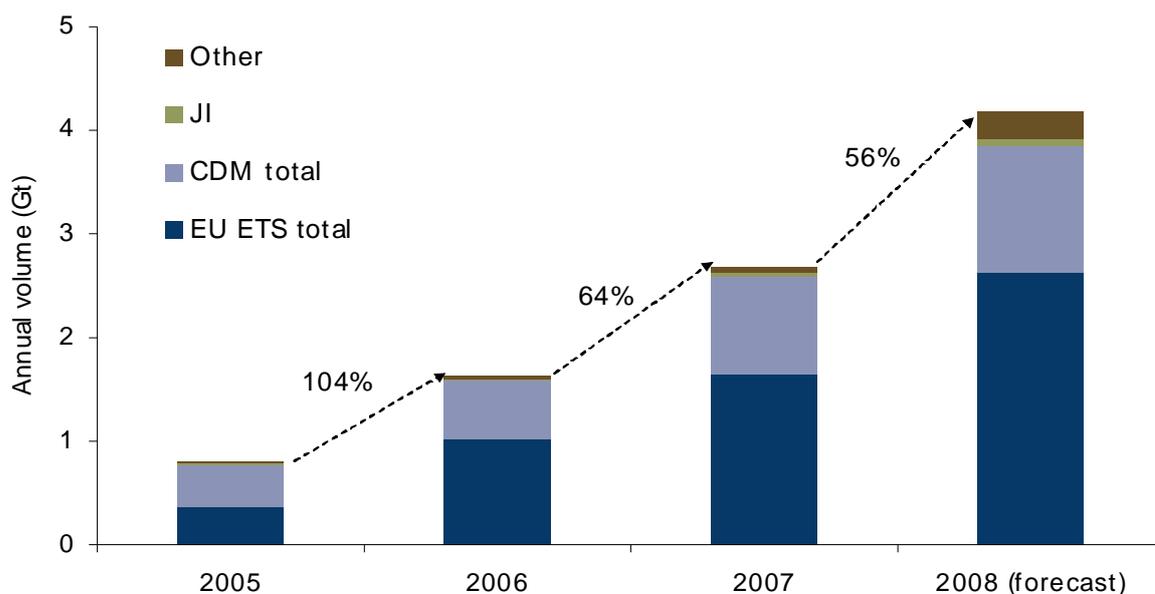
So when relatively small volumes have been transacted in the AAU market so far, it is partly explained by different price expectations on the buyer and seller side. Buyers and sellers tend to look at different price indices and have different perceptions of environmental quality and reputational risk. Furthermore, buyers often perceive that weak or non-existing institutions on the sell-side imply a high counterparty credit/AAU delivery risk for the buyer.

4.4 Future prospects of GIS and the Kyoto market

Today, activity in the GIS/AAU market is dwarfed by trading activities in other segments of the international carbon market such as the CDM and EU ETS. As illustrated in Figure 7, the EU ETS and the CDM were expected to trade to the tune of 2500 Mt and 1400 Mt in 2008, respectively. AAU trading and GIS is expected to be less than 100 Mt in 2008.

This of course raises a question: will we see a rapid growth in the GIS/AAU segment in the future that constitutes a substantial share of the global market? And, if so, what is the risk that the significant AAU surplus will flood the market and lead to collapsing carbon prices? For reasons that will be elaborated below, it appears likely that the GIS/AAU market will grow at a modest pace. And partly because of this, there is a low risk that AAU will severely suppress prices.

Figure 8. The size of the carbon market (Gt)



Source: Point Carbon

The AAU/GIS market is largely a government-to-government market, with the exception of a few Japanese companies. Hence, both on the sell and the buy side, the players involved are mainly government representatives. From what Point Carbon sees, and also expects for the future, governmental representatives have a different mandate and act differently in the market than corporate traders in other markets.

Unlike the private companies that have to surrender allowances every year, Annex B governments in the Kyoto Protocol do not have to comply with their obligations before 2013. Hence, they are in no rush to conclude the transactions, and inter-governmental commercial negotiation processes tend to take much longer than private commercial negotiations.

Secondly, buyers have normally a different mandate compared to private traders. While private traders will be on both sides of the market, buying and selling continuously, governmental bodies are not traders, but purchase programs and limit their mandates to try to buy credits and allowances at the lowest possible cost. One consequence is that the AAU market will be far less dynamic than the private markets, having a unidirectional flow of assets. While,

for example, a CER tends to be traded three times per year, surplus AAUs will probably be traded only once.

Thirdly, even if the market is flooded by AAUs, it does not necessarily lead to more CERs and ERUs being offered in the market. Most governmental purchase programs do not have the mandate to sell off the credits they have already bought, and for many of them it will probably be difficult politically to buy “hot air” cheaply and start offering CERs and ERUs to the market. Hence, even if we see lower AAU prices in the future, it can have limited impact on the prices of CERs, ERUs and EUAs.

Fourthly, there are constraints that reduce the risk of a price collapse for AAU/GIS on the seller side. Several EU countries, such as Poland and Romania will have a substantial surplus. These will probably constrain the level of sales in the years at the end of the Kyoto period as they are likely to have a significant AAU deficit under the terms of a new post-2012 climate agreement. E.g. if a new agreement allows for banking of this surplus, they will have a strong incentive to do so. With reference to Figure 6, we can see that the largest potential sellers of AAUs are Russia and Ukraine. Russia is constrained by institutional factors. Unless there is a radical change of mind at the highest level of government, it seems likely that Russia will continue to focus on developing JI projects and not sell off their AAUs.

This leaves Ukraine as the only large seller left, giving it almost monopolistic power. If we assume that Ukraine will act as a fairly rational actor, there is no reason why the country should start offering its AAUs at a rate that would depress prices. On the contrary, the country has every reason to restrain supplies of AAUs in order to maximise its revenues, if it acts as a rational actor.

So where does this take us? Firstly, the major sellers have good reasons to restrain supplies so that prices stay at a relatively high level. The high concentration of sell side countries makes it easy for them to exercise significant market power. Secondly, if there would be an oversupply of AAUs, it is likely to happen relatively late in the Kyoto period (i.e. not before 2011) due to the inertia of government negotiations over contract terms. Thirdly, a collapse in AAU prices does not necessarily lead to a collapse in prices for other carbon credits and allowances, such as CERs, ERUs and EUAs.

So at least for the next couple of years, it seems likely that the GIS/AAU trade will constitute a comparatively small share of the global carbon market, being characterised by low liquidity and hampered by institutional constraints. However, although the GIS may be dwarfed by the CDM, it is still a pretty interesting market for the sellers. As noted above, the value of the AAUs expected to be transacted could be in the range of €9 billion. For most of the seller countries this would be a major revenue stream that could be helpful for

financing much needed infrastructure upgrades, etc. Table 9 shows estimated amounts of AAU supply through GIS by major selling countries.

Table 9. GIS-based AAU supply to be offered by major selling countries during first commitment period (estimates made by Point Carbon, 2008, unless otherwise indicated)

| Country | Czech Rep. | Hungary | Latvia | Poland | Romania | Russia | Ukraine |
|-----------------------|------------|---------|--------|-----------|-----------|--------|------------------------|
| MtCO ₂ -eq | up to 100 | 50 | 30 | up to 100 | up to 100 | 0 | 100-1200 ²⁸ |

Another point to be observed is that for countries which prefer to maintain the carbon market, there is a profound interest that the evident lack of balance in the availability and demand of AAUs should not drive down the carbon price to zero and render the Kyoto system inoperable. On the other hand, the same countries are interested to maintain the carbon-price at an “affordable” level.

Finally, according to some experts, GIS may have an emerging comparative advantage in contrast to CDM. Even though GIS-based AAUs can’t be traded on the EU ETS, sovereign buyers and companies authorized to buy AAUs provide a large market where demand is there for a product with price slightly below CER prices and with relatively little uncertainty. GIS also provides for portfolio and risk diversification to those carbon-credit buyers who are over-exposed to CDM markets already.

²⁸ Estimate by The Carbon Trust

5 The current status of GIS developments in CEE countries

5.1 Eligibility issues

As mentioned in the previous section, to participate in IET, the party has to fulfill the eligibility criteria for IET defined in Article 17 of Kyoto Protocol and the modalities, rules and guidelines defined in the Marrakesh Accords. Table 10 lists the time when these countries have become or are expected to become eligible for the IET and Track One JI. The second column shows the countries' status on the national procedure on Track One JI.

Table 10. Eligibility status and JI Track One Procedures²⁹

| | Becoming Eligible For IET and Track One JI | Have operational ITL connection since | Have adopted Track One JI procedure |
|-----------------------|---|--|--|
| Bulgaria | (25 November 2008-Expected) | 16 October 2008 | No, but in the near future |
| Czech Republic | 21 Feb. 2008 | 16 October 2008 | Yes |
| Estonia | 15 April 2008 | 16 October 2008 | No |
| Hungary | 30 Dec. 2007 | 11 July 2008 | Yes |
| Latvia | 29 April 2008 | 16 October 2008 | No, but in the near future |
| Lithuania | 22 April 2008 | 16 October 2008 | No, but in the near future |
| Poland | 29 April 2008 | 16 October 2008 | No |
| Romania | 1 Sep. 2008 | 16 October 2008 | Yes |
| Russia | 20 June 2008 | 4 March 2008 | No, but in the near future |
| Ukraine | 29 April 2008 | 28 October 2008 | Yes |

(www.unfccc.int, 2008. Survey done by the authors, 2008)

²⁹ The information in this table was gathered by May 2008.

For the EU accession countries, the IET eligibility criteria are in line with the requirements of the EU ETS. All countries except Bulgaria have already met all the eligibility criteria.

By early November 2008, Hungary had already had over 30 Track 1 JI projects in the pipeline or approved, covering renewable energy, CH₄ recovery and N₂O projects. Romania has just approved the Track 1 JI procedure. The country has already had 16 JI projects approved, among them one Track 1 JI project (Personal Communication, Veronica Toza, Nov. 2008). The information related to JI is not directly relevant to the GIS. However, the data on the development of Track 1 JI could be used as a reference for these countries' status on carbon trading related mechanisms.

5.2 Current state of GIS in specific CEE countries

5.2.1 Hungary³⁰

5.2.1.1 General development of GIS

In June 2007, the Hungarian Parliament passed the Act LX of 2007 on the implementation framework of the Kyoto Protocol, which grants JI and GIS legislative status (Hungary 2007a). In the same year, a secondary law, "Government Decree 323/2007. (XII. 11.) Korm. on the implementation of Act LX of 2007" was also approved by the Government. Decree 323/2007 further defined the key elements in the GIS, such as the conditions for the sale of AAUs, conditions of the GIS, conditions for and decisions over applications of the sales revenue and monitoring and verification issues, as well as EU state aid rules in relation to GIS (Hungary 2007). In addition, a draft version of an Operational Manual on the implementation of the Green Investment Scheme in the buildings sector has already been finalized in August 2008.

The country has a total amount of AAU of 542 million tCO₂eq, in which 395 million tCO₂eq is set for commitment period reserve, and 10 million for JI reserve. The country's emission trend is expected to be between 432-443 million tCO₂eq, thus another 47-48 million AAUs is reserved for this emission growth in addition to the commitment period reserve. Thus, the available AAUs are in the order of 80-90 million. The government plans to open 45-55 million AAUs for GIS, of which 15 million AAUs will be for the pilot phase of GIS and 30-40 million for the 2nd phase of the GIS (Hungary 2007). The pilot phase is for learning and fine-tuning the GIS architecture and planned to run for a year

³⁰ This section has been largely based on the case study that was part of the present project. For more details, please consult the summary of the case study in 5.4.1.

before further sales of AAUs are envisioned. This period also allows for developing the greening framework on new areas. However, disbursement operations from the pilot phase will continue along with new funds from the second larger-scale phase and the operations will merge.

5.2.1.2 Management structure and budgetary option for the AAU sales revenue of the GIS in Hungary

The revenue from the sales of AAU enters a special account at the Ministry of Environment and Water (MoEW) and does not stay in the state budget. This system is strengthened by provisions in each year's Act on State Budget. The Ministry of Environment and Water is the institution in charge of the management of the GIS scheme and the management of the GIS fund. The Minister of Environment and Water is authorized by the Act LX of 2007 to negotiate, draft and sign the contracts with the buyers, through which the condition of the greening activities and the price of AAUs are determined. MoEW is then responsible for the fund management, selecting projects, supervising the projects and disbursing money to the beneficiaries (Hungary 2007) in line with the priorities of the National Climate Strategy.

5.2.1.3 Principles for GIS design

The following principles were employed by the MoEW when designing the GIS. The most important share of all the money is channeled to emission reduction activities. This is ensured by the earmarking of the AAU sales revenue, with the one exception that for administrative purposes no more than 5 % of the GIS revenues can be used, as spelled out in Government Decree 323/2007. (XII. 11.). The GIS ensures additionality, which is defined by Hungary as climate additionality and legal additionality. Climate additionality means that all GIS activities should result in quantified emission reductions, which are verifiable. Soft greening is excluded from the greening option. This decision grants Hungary a better position when negotiating with the buyers on the price of AAUs. Legal additionality is defined as the greening activities not covered by measures mandated by legislation in force (Feiler 2008) and it is reflected in the development of operational procedures for GIS. Third, concerning the priority area for greening activities, the cost-benefit ratio of the emission reduction activities is the primary concern for choosing projects. Along with these, the Hungarian GIS scheme allows for support not only in a stand-alone manner, but also on areas where other state or EU funding is also available, but there is a need in all cases for producing additional emission reduction over what is mandated by requirements for other support. The possible combination of various support schemes is designed to strengthen each other and to reduce overall transaction costs.

The reasons for the possibilities of such hybrid systems are twofold:

- support schemes should be always compatible and strengthening each other
- combinations of support schemes allow for projects with higher emission reduction potential but having larger investment requirements or longer payback periods that make them bankable with the GIS revenues.

This hybrid solution can be applied to the greening activities in retrofitting public and household buildings. This complementary nature of the Hungarian Green Investment Scheme overcomes many challenges created by some other modality choices, such as the additionality and cost-effectiveness criteria.

5.2.1.4 Priority areas and programmatic window for the GIS

Hungary has explicitly indicated that GIS will be applied to potential project areas that were not attractive for JI projects (Feiler, 2008). This fact determines the areas that the Hungarian government aims to target by its Green Investment Scheme during the first stage. The residential and public sectors are supposed to receive the first AAU revenues in order to encourage energy efficiency and climate mitigation activities in this field. In addition, Hungary's National Climate Change Strategy proposes renewable energy for heating and biogas production for transportation purposes as key targets for GHG reduction (National Climate Change Strategy 2007; Feiler 2008; Lazi 2008).

It is envisioned that along with the "programmatic window" of the Hungarian GIS scheme, which targets in the pilot phase residential and public sector building energy efficiency, there will be a "project window", likely starting with the second phase of the Hungarian GIS. This project window is envisioned to be open for the competitive sector, to support and stimulate new and innovative ideas for emission reduction.

5.2.1.5 Verification and monitoring of the greening activities

- Programmatic window

The verification is different for programmatic and project window. For programmatic window, the projects are usually small in scale, disperse and large in number. In this case, the greening activities involve calculation of emission reduction by potential beneficiaries. A technical protocol is provided by the government, regarding energy consumption of the building by its physical properties. The beneficiaries use the technical protocol provided by the government to calculate the emission reduction and report it in the form provided by the government when applying for the fund. At the same time, a physical check of the electricity and gas bills can help to prove the effect of the emission reduction as well.

According to the technical protocol, the emission reductions could be calculated by using the standardized factor or formula directly. Then if the beneficiary complies with all the conditions of becoming eligible for funding, they get a notification regarding the grant from the GIS operating entity. After the retrofitting/building project is done, a new calculation is to be made as verification and there will be a random check on whether the activities have taken place. Following verification the grant is disbursed to the owner of the project.

In short, the verification for the programmatic window is done by a) reporting by the beneficiary of the project with documentation; b) random verification by the GIS Management Office.

- **Project window**

The projects in the project window are usually large projects, where a third party verification takes place according to the ISO 14064 standard. The verifier will be a Hungarian domestic verifier and will verify emission reductions achieved annually. However, in the pilot phase of the Hungarian GIS the project window is not planned to be opened.

In general, verification should focus on the cost-effectiveness, extent and expected time-period of the emission reduction. The Hungarian GIS system distinguishes between two basic types of verification:

1. reporting by the beneficiary of the project with documentation and random verification by the GIS Management Office – for small projects where it is easy to establish emission reductions;
2. third party verification according to ISO 14064 standard – for large and/or complex projects (Feiler 2008).

5.2.1.6 Project selection/approval

The GIS grant application should contain a technical part, which assesses the carbon efficiency of the planned measures, by providing detailed technical information. The method for providing such information is based on the methodology mandated by the EU's Energy Performance of Buildings Directive (EPBD). For new buildings there is one exception, the passive house category, where the calculations should be submitted using the methodology of the German Passive House Institute. For improvements in existing buildings, two calculations should be submitted, one on the current state of the building and one on the planned state after the application of planned measures.

The submitted GIS grant applications are to be scrutinized by the authorized agency. The evaluation consists of two stages. To begin with, a formal check of the application's completeness and validity of the submitted documents should be undertaken. A successful formal evaluation is followed by a technical scrutiny, the so-called "energy-environmental evaluation". This stage requires involvement of specialists – technical experts. They perform the assessment according to the following criteria:

- compliance of the planned refurbishment with requirements that do not pertain to energetics (for example, fabric protection);
- feasibility of the planned renovation and appropriate demonstration of the feasibility in the application;
- relevant and adequate financial assessment of the planned measures;
- compliance of CO₂ reduction and energy saving calculation with relevant guidelines (namely, with 7/2006 (V.24.) decree – following the EPBD)

The Hungarian GIS scheme as a basic option allows for emission reduction calculation for the 1st Kyoto commitment period. However, in case of new buildings and building refurbishment, the lifetime of certain measures is predictably 20-30 years, in case of new buildings the general life span is 80-100 years. For such cases the emission reductions are to be calculated till 2020, as it is likely that these measures will lose their additionality by then (strengthening building energy standards might require such measures by law by then).

In case of the planned project window yearly assessment of emission reductions is envisioned according to the ISO 14064 standard.

5.2.1.7 Summary of GIS development in Hungary

Hungarian GIS design is one of the most complete ones, in terms of its coverage of the elements in GIS modality. The Hungarian government also employed some innovative ideas in the monitoring and verification process, such as using the ISO 14640 as well as M&V based on sampling. These innovations ensure that while the country focuses on rigorous rules to ensure the environmental integrity of the scheme and cater for the demands of buyers for hard and verifiable emission reductions, such as additionality requirements, as well as hard greening only, its potential negative impacts on excluding project types with high sustainability benefits are compensated by these other modality choices that lower costs, facilitate bankability through lining up co-financing, and simplify the project cycle. Therefore Hungary can be

considered as a top-runner in GIS development, especially that as first official moves in the direction of considering a GIS took place already in 2006.

5.2.2 Latvia³¹

5.2.2.1 General development of GIS in Latvia

The Latvian government has a strong political commitment towards the development of GIS. In 2006, the Cabinet of Ministers adopted the decision to participate in IET under Article 17 of the Kyoto protocol. In 2007, Latvia has passed the law on the Kyoto Protocol mechanism, in which the GIS was adopted to manage the AAU sales revenue. Now, Latvia, along with Hungary, has one of the most advanced GIS frameworks.

The country is working on the secondary legislation to better elaborate the general law, by which the basic procedures for managing the GIS fund will be covered. The process of making the secondary law will take place simultaneously with the process of the pilot transaction, through discussion with the buyer. The buyer's view will influence how the GIS structure could be better formulated, such as monitoring and verification plan, timeframe for the GIS, etc.

Latvia has an 8% reduction target under Kyoto Protocol, with a base year of 1990 (UNFCCC 1997). The country has a total number of 119 million CO₂e of AAU, out of which 53 million is used for the commitment period reserve (UNFCCC 2007). Latvia became eligible for International Emission Trading in April 2008. The Latvian government has already adopted a national strategy of AAU management, allocating around 40 million AAUs for GIS, out of which 8-10 million AAUs are intended to be sold during a pilot transaction late 2008. The MOE has already started negotiations with a limited number of buyers on the AAU transaction in the pilot phase. The first deal is expected to be concluded by December 2008 (Prūse 2008; PC5); it is projected to involve five buyers, including Japan, the Netherlands and Austria (Point Carbon, 2008). As mentioned above, Latvia expects to gain experience through the pilot transaction, which will shed light on the secondary legislation for the GIS.

5.2.2.2 Management structure and budgetary option for the AAU sales revenue of the GIS in Latvia

The Ministry of Environment is the major institution to coordinate the GIS work and manage the GIS funding. Latvian Law on Participation of the Republic of Latvia in the Flexible Mechanisms under the Kyoto Protocol clearly states that

³¹ Unfortunately, despite the continued and strong effort by several report authors, our Latvian contact did not have time to update the information in this report to reflect Fall 2008 circumstances. This section was written in Spring 2008 and not updated since then.

all income from the sale of AAUs shall be earmarked for “greening” projects. Money from the sale of AAUs is transferred to an income budgetary account in the State Treasury. Disbursements are organized under the budget program “Climate change financial instrument” which is the official name of GIS in Latvia (Prūse 2008).

5.2.2.3 Monitoring and verification issues

Details of the monitoring plan of the Latvian GIS are still not yet finalized. However, key elements for monitoring have been decided upon. The monitoring plan includes financial audit; check of procedural conformity of GIS; assessment of greening results [PC 5]. The report of the greening activities will be submitted to the Latvian government and the buyer annually. For the purpose of transparency and accountability to the public, an Advisory Council is proposed to be established for the GIS fund. The Advisory Council will comprise relevant stakeholders including state institutions, non-governmental organizations and buyers. Audits are to be conducted by internationally recognized organizations. The verification procedure has not been clearly defined yet as the development of the secondary law for GIS is still work in progress.

5.2.2.4 Priority areas for investment

The law on GIS ensured the solid legal background for the scheme to take place. However, the size of the surplus AAU is quite limited and the amount allocated to the GIS is comparatively small. Meanwhile, Latvia claims to have limited opportunities for greening with direct reductions of GHG. The country will allow both hard greening and soft greening, with the latter to balance the statedly lack of hard greening opportunities in the country. However, the Latvian government asserts that revenues from every assigned amount unit sold will be channeled to “greening” activities.

The hard greening focuses on the following areas: energy efficiency in buildings sector, such as refurbishing the old buildings; small scale RE, such as biomass CHP; biogas recovery and use; heat distribution in district heating systems; industrial power intensity. Soft greening will focus on application of innovative low carbon technologies: lower carbon transportation systems; other low and zero-carbon emission technologies; capacity building for climate change policy design and implementation and capacity building for GIS management (Prūse 2008).

5.2.2.5 Summary of GIS developments in Latvia

The GIS in Latvia is also almost finalized as it covers almost all the elements in the modality. The Latvian GIS shares a lot in common with the Hungarian GIS,

in terms of basic structure of GIS management, GIS priority areas, monitoring scheme arrangement, etc. However, as the country is still in the process of developing its secondary law, some details of the scheme are not completed yet, such as emission reduction calculation and methodology.

5.2.3 Ukraine

5.2.3.1 General development of GIS in Ukraine

In 2006, the World Bank completed a report “Green Investment Scheme in the context of the second commitment period under the Kyoto Protocol in Ukraine”, which outlined the options for a GIS in the country. In March 2008, Decree No. 221 on “The Procedures for Consideration, Approval, and Implementation of the Special-purpose Environmental (Green) Investment Projects during the First Commitment Period for Parties to the Kyoto Protocol of the UNFCCC” was adopted. The decree is the major legal document for GIS development. The country became eligible for participation in International Emission Trading and, accordingly, for GIS implementation on April 29, 2008. Ukraine has a total AAU of 4.6 Gt CO₂e, out of which 2.1 Gt CO₂e is set for commitment period reserve (UNFCCC 2007). According to the World Bank, more than 1 Gt CO₂e can be potentially used for transactions through Green Investment Schemes (Filonenko 2008). Point Carbon gives a more precise estimate of 1.2 Gt CO₂e assigned for GIS. It is likely that the first AAU transaction will take place by the end of 2008 or early 2009. The pilot transaction might involve about 20-50 million CO₂e (Filonenko 2008).

5.2.3.2 Management structure and budgetary option for the AAU sales revenue of the GIS in Ukraine

The government assigned the National Environmental Investment Agency (NEIA), which was established in May, 2007, as the main institution for both JI and GIS management and for the country’s compliance with the Kyoto Protocol’s requirements. With regard to GIS, NEIA is responsible for negotiations with buyers as well as for the design of Green Investment Schemes and for domestic greening activities (Ukraine 2008; Filonenko 2008).

In January 2008, the government set up a price floor for the AAU and ERU in order to fight against corrupt practices (Semkiv 2008). However, the price floor was not an effective instrument for fighting insufficient transparency as it creates an imperfect market. In April 2008, the government decided to abolish the price floor (PointCarbon 2008).

NEIA is in charge of GIS approval procedure, from the project selection to the project implementation and monitoring. Preliminary selection of the projects is

done by the internal working group, consisting of participants from different interested ministries. The projects are approved according to the conditions of the contracts signed with the buyers. Buyers can choose the project type. After that, NEIA selects a project manager and accredits the independent entities for determination of the GIS project documentation (Semkiv 2008).

At this stage, some operational rules for GIS have not been clearly determined, such as the regulations and timeframe for establishing the inter-departmental working group; the accreditation rules for independent entities, and clear rules for tender and for financial incentives; guidelines for international auditors and accreditation experts. The AAU proceeds are envisioned to be channeled to the special account within the state budget, which reduces the risk of misusing the funds. If the state budget is in deficit or there are other budgetary problems, then the GIS fund may not be channeled to greening activities.

Ukraine is planning to use GIS for financing in the areas which were not adequately addressed by JI (e.g. buildings sector, afforestation), but still can potentially contribute to climate change mitigation activities. As "green" projects in Ukraine's priority areas do not receive international funding and national programs do not cover them sufficiently either, financial additionality of a planned Green Investment Scheme is ensured.

5.2.3.3 Priority areas for investment

The GIS has both hard greening and soft greening options. The priority areas for investment include housing and public utilities, reconstruction of district heating systems, forestry, and water supply. Hard greening is guaranteed for transactions made until the end of 2008; in the 2009-2012 period, 25% of the GIS funding is planned to be used for soft greening (Semkiv 2008; PC7).

5.2.4 Czech Republic

5.2.4.1 General development of GIS in Czech Republic

In November 2007, the government of the Czech Republic made a decision on further GIS implementation steps. In June 2008, the Czech government adopted legislature on Emission Trading with one of the chapters devoted to GIS [PC 2]. According to a government official, the government was preparing an auction of AAUs in December, 2008, with around 10 million AAUs on offer. However, due to a sharp decline in carbon prices, the country has postponed the first auction until February 2009 (Point Carbon, 2008).

The government has already signed MOU with Denmark, Austria and Japan. Czech Republic is planning to earn 10-25 billion Czech coronas (USD 0.9-1.5

billion) from selling AAUs by the end of 2012 (Point Carbon, 2008). Apart from auctioning, the government is ready for bilateral transactions, and is negotiating with Austria, Japan, New Zealand, and Spain on this issue (Point Carbon, 2008). The planned GIS projects are supposed to have a 15-year crediting period with the greening ratio about 1:3 to 1:4 [PC13].

The Czech Republic has an 8% reduction target under Kyoto Protocol, with a base year of 1990 (UNFCCC 1997). The country's total AAU amount is 902 Mt CO₂-eq., with 732 Mt CO₂-eq. for the commitment period reserve (UNFCCC 2007). The government already has a national AAU management strategy, and possible allocation to GIS would be 100 Mt CO₂e [PC 2].

5.2.4.2 Management structure and budgetary option for the AAU sales revenue of the GIS in Czech Republic

The government has decided that, by 2010, the revenues from IET will be used for financing energy savings in residential buildings, as well as administrative and public buildings [PC 2].

The Ministry of Environment (MOE) will be the major institution to coordinate GIS management and to negotiate with the buyers on sales of AAU. The MOE will be responsible for establishing a Working Group (WG) for the GIS management both in international negotiation with buyers and coordinated work with the State Environment Fund, while the State Environmental Fund (SEF) will be responsible for the management of the funding under GIS. AAU revenues are supposed to be transferred to a special account under MOE, not entering the state budget (Fiala 2008).

5.2.4.3 Priority areas for GIS investment

Both soft and hard greening will be included in the GIS in Czech Republic. Similar to the choices of the other countries, Czech Republic also chose retrofit of old building stock; promoting energy efficiency in buildings, energy efficient appliances; and biomass for district heating as priorities for the hard greening choice. For the soft greening, it covers administrative procedures. Other areas for soft greening options have not been decided upon.

5.2.4.4 Monitoring and verification of the GIS

The Czech Republic has included GIS into legislation on Emission Trading, but details of the monitoring and verification procedures have not yet been elaborated. However, the government is considering the option of having an independent national auditor, most likely National Environmental Fund, to verify the emission reductions.

5.2.4.5 Summary of GIS in Czech Republic

GIS development in Czech Republic is very fast. The government is almost in the final stage for the law to be passed. Meanwhile, the government demonstrated a very good understanding of the issues involved in GIS. It is to be seen whether the Czech EU presidency in the first half of 2009 will impact the process as it drains seriously the administrative capacity. Some concrete progress from Czech Republic could be expected in the future.

5.2.5 Romania

5.2.5.1 General development of GIS in Romania

Romania has an emission reduction target of 8 % under the Kyoto Protocol and has a total AAU of 1.3 Gt CO₂eq and a commitment period reserve of 0.78 Gt CO₂eq (UNFCCC 2007). About 100 million AAUs can be allocated for Green Investment Schemes (Personal Communication, Vlad Trusca). Currently, the government is working on updating the National Strategy on AAU management, in which the amount of AAU to be traded will be decided upon and the indicative price range of AAU will be established.

In Romania, the discussion on GIS has been going on for more than five years. In 2006, a report on “Developing a Green Investment Scheme in Romania” (Andrei et al., 2006) proposed a general structure for GIS in Romania, including the basic management structure, the priority areas, etc. However, the final decision on GIS by the government of Romania was not made until recently.

The Romanian government officials confirmed a strong political will towards establishing the GIS. A draft Governmental Decision for GIS was prepared based on the REC study (Andrei et al., 2006) and has undergone internal negotiations. At the moment, the government is preparing the database of projects that might be eligible for GIS implementation. In the meantime, negotiations with potential buyers have already been started. By the end of 2008 or early 2009, the Romanian government is planning to launch the GIS pilot phase.

5.2.5.2 Management structure and budgetary option for the AAU sales revenue of the GIS in Romania

The Ministry of Environment is the key institution responsible for the GIS and is entitled to negotiate with buyers as well as to approve projects under GIS. The GIS will be managed by the Environmental Fund Administration or a Specialized Unit in the Ministry. The revenues go into a special budget of

Environmental Fund/Specialized Unit in the Ministry and are coordinated by the Ministry of Environment (PC, 14).

Romanian GIS has chosen both soft greening and hard greening options, with soft greening having a share of 5-10 % (PC, 14). For hard greening, the priority areas are the rehabilitation of district heating systems; the construction of small co-generation installations (non-ETS); recovery of methane generated by urban waste landfills; fuel-switching in energy productive installations (non-ETS); reducing non-CO₂ emissions in industrial installations; energy efficiency in buildings (public and private); GHG emission reduction in agriculture and transport sectors and forestry. For soft greening, the priority areas have not been determined yet (Trusca 2008).

5.2.5.3 Concerns over the monitoring and verification issues

The monitoring will focus on the project implementation rather than on emission reductions [PC 9]. Romania is considering in some cases simplified monitoring and verification of emission reductions. The basic idea is to have no baseline, but a simplified approach to calculate these emission reductions and to verify them [PC 14].

Romania is creating a database of projects for greening. When signing the contract, the buyers are provided with a list of projects from the project database and buyers can choose the projects they like. Greening projects in the database are selected on a cost-benefit principle. Projects are implemented after the AAU sales revenue is received.

It is questionable if the approach of having no baseline, no emission reduction calculation and verification can be accepted by buyers who are used to the strict baseline setting and verification process in the other Kyoto-based mechanisms and want to see the environmental integrity of the schemes ensured. However, at the time this research was conducted, the government of Romania is very confident of the approach and it is highly possible that it will be employed in GIS in Romania [PC 9].

5.2.5.4 Summary of GIS development in Romania

The government of Romania has demonstrated very strong political will regarding the development of GIS. The framework for a Green Investment Scheme is nearly finalized, and negotiations with potential buyers are being held. However, the approach of having limited emission calculation, verification and monitoring is an approach not pursued in other countries' GIS. Whether this approach would be appropriate will be further analyzed later.

5.2.6 Other countries with modest development of GIS

5.2.6.1 Bulgaria

Bulgaria has a target of 8% reduction under Kyoto Protocol, with a base year of 1988 (UNFCCC 1997). The nation's total AAU is 610 Mt CO₂e, with a commitment period reserve of 353 Mt CO₂e (UNFCCC 2008). The surplus of AAU in Bulgaria is expected to be around 130 million AAUs (UNFCCC 2007).

Until now the country has not produced a national strategy to manage the AAU. Bulgaria started GIS work back in 2005, far before most of the other countries in the same region. With funding and technical assistance from World Bank, a report titled as "Options For Designing A Green Investment Scheme for Bulgaria" was developed in 2005. The report was among the first country GIS option studies. However, the development of GIS has been frozen since 2005.

In July 2008, the Bulgarian Minister of Environment and Water officially announced that, in principle, the Bulgarian government supports the sale of its surplus AAUs to other nations under a GIS approach. According to this announcement this would be implemented through the signing of a bilateral agreement between the Bulgarian government and the buyer country (Memorandum of Understanding). The proceeds are planned to be invested in energy efficiency and environmentally friendly technologies. The country will by the end of 2008 decide if and how to proceed with a GIS.

One of the main rationales for Bulgaria to consider the implementation of a GIS is the difficulties the country faces with JI. GIS may be implemented as an alternative to JI (Track 1).

5.2.6.2 Poland

Holding the third largest share of surplus AAUs in the world (Ürge-Vorsatz, Novikova, and Stoyanova 2007), the Polish government is now very positive about developing GIS. In April 2008, Poland became eligible for International Emission Trading. The government has already started initial negotiations with the WB on collaboration to develop the Polish Green Investment Scheme [PC8]. The GIS legislature development is being elaborated (Budzanowski, 2008).

Poland has a 6% reduction target under the Kyoto Protocol, with a base year of 1988 (UNFCCC 1997). The total AAU amount is 2.65 Gt CO₂eq, with a commitment period reserve of 1.94 Gt CO₂eq (UNFCCC 2007). The government is in the process of creating a national AAU strategy in which the total available AAUs will be allocated to different purposes: the commitment period reserve, back-up for JI and GIS. The surplus is estimated to be 706 million tCO₂eq. (Survey 2008; Budzanowski, 2008).

According to an interview with a governmental official, the main institutions related to the GIS and AAU revenue management work will comprise Ministry of Environment, the National Administration of the Emission Trading Scheme, National Fund for Environmental Protection and Water Management, and EcoFund (PC 8; Budzanowski, 2008). It is planned to create a National Climate Fund where a special account for GIS funds is likely to be launched (Budzanowski, 2008).

According to the interview with an official from MOE, the priority area for investment would be more likely in the areas that are not covered by current funding sources, such as: retrofit of old building stock, promoting energy efficiency in buildings, promotion of passive buildings, adaptation, capacity building on climate change and industrial processes [PC 8] as well as emission reduction in transportation sector and methane recovery. A sectoral approach will be considered as well (Budzanowski, 2008).

5.2.6.3 Lithuania

Lithuania has a Kyoto Protocol emission reduction target of 8%, with a base year of 1990 (UNFCCC 1997). The total AAU is 227million tCO₂-eq., with 109 Mt CO₂-eq. for the commitment period reserve (UNFCCC 2007). Although Lithuania has not approved a National AAU management strategy, the possible allocation for GIS could be up to 50-55 million tCO₂-eq. according to a government official [PC6].

Currently, no legal document regarding GIS has been enforced. The country has developed draft legislature on climate change issues one of the chapters of which deals with GIS [PC 6]. After this, the nation will possibly have a more positive position on GIS development.

As the discussion on GIS is still in its early stage, details of the modality of GIS have not been decided yet. The possible organization in charge of the GIS will be Ministry of Environment and the possible institute for fund management will be Environmental Investment Fund (Skrockaite 2008).

5.2.6.4 Estonia

The Estonian government is now showing interest towards development of GIS. The government expects that GIS will give the country more flexibility according to the national circumstances and could help avoid the complicated and lengthy JI-Track 2 project cycle and consider projects which might be disregarded by JI-Track 1, for which Estonia became eligible on April 15, 2008. The government is still in an early stage of planning the GIS. Thus, details of the GIS modality are not clear at present [PC 3]. The GIS legislature is under discussion,

and the draft legal framework is likely to be prepared by spring 2009. The country is considering GIS implementation starting 2010, however this is still very tentative [PC3].

The country has an 8% reduction target under Kyoto Protocol, with a base year of 1990. (UNFCCC 1997). The nation has a total AAU of 196 Mt CO₂-eq., with 107 Mt CO₂-eq. for the commitment period reserve. The possible surplus for entering into the GIS is less than 90Mt (survey done by author).

5.2.6.5 Russia

Russia was the first country to initiate the idea of GIS back in 2000. However, eight years have passed and the government still has not adopted a decision on the development of the GIS. In January 2008, the World Bank started a country option study for Russia. The study is supposed to give insights on setting up GIS, in terms of GIS management structure, modality design, priority areas, etc. There are several reasons why Russia is slow in developing GIS. One of the concerns is that the government is interested in extending the GIS into a post-2012 regime. The other reason is that the government's attention is diverted by the revenue from oil and gas exports. The AAU sales revenue is not of the country's priority concern [PC 11].

Russia does not have a national strategy on AAU management, but is now in the process of creating it. The nation has a target to maintain the same emission level as the base year of 1990 (UNFCCC 1997). The nation has a total AAU amount of 16.6 Gt CO₂-eq., with a commitment period reserve of 10.6 Gt (UNFCCC 2008). The country is planning to have 10%, around 1-1.6 Gt to back for JI. The possible allocation of AAUs to GIS would be 800-1000 million tCO₂-eq. [PC11]

According to an interview with a government official from the Ministry of Economic Development of Trade [PC 11], the country is considering soft greening as the major greening activities type, which will cover not only issues related to climate change but broader pollution control issues.

5.2.6.6 Summary of the countries with modest progress in GIS development

The countries with modest progress of GIS development could be divided into two categories. One category is the countries that do not want to establish GIS, such as Bulgaria. The other category is the countries with GIS development in a very early stage. For the latter category of countries, the experiences from the fast-runners, such as Hungary and Latvia, could be used for their own benefit.

5.3 Summary of progress on GIS by CEE countries

5.3.1 Findings on the GIS in the CEE countries

Based on the review of the country summaries above, it can be concluded that Hungary and Latvia are the front-runners in GIS as of October 2008. However, the situation has been dynamically changing over the past few years, and therefore those now hesitant with GIS may still generate sudden progress.

Based on the description in the previous section, Table 11 compiles the modality choices used in GIS designs in CEE countries. It is important to note, however, that these countries are in different stages of development of the scheme, so the final architectures may still change for a few, and some decisions have not yet crystallized for most. Some countries have already got GIS fully established, some are in the process of establishing it. A few general statements can be made about GIS schemes in the CEE region as of August 2008.

For the funding transparency, most of the countries either have the GIS revenue not entering the state budget or going to a special account in the state budget. However, Ukrainian GIS revenue is supposed to flow to the state budget. Most countries introduce provisions that ensure that the AAU revenues do not enter the state budget, but are directly channeled to funds earmarked for the greening activities. This is important to alleviate the delivery risk of GIS, especially in countries with budgetary problems or compromised track records in financial discipline.

Environmental integrity is assured in part by ensuring additionality of GIS investments. While some EU legislation mandates certain financial and legal additionality provisions in EU member states in respect to certain schemes such as the ETS or aid such as the Structural Funds, these do not fully ensure the environmental integrity. From the research only Hungary was revealed to make a concerted effort at enforcing additionality. Presently, however, additionality is not mandated in a legislative sense, but through the setup of the scheme that provides funds only for investments that are intrinsically considered as advanced investments from a climate perspective. At the same time, some countries do not opt to focus on additionality, such as Romania. Some project types that emerge in certain GISs as potential target areas, such as capturing landfill gas, are questionable from the perspective of environmental integrity, since such measures are now mandatory in the EU.

Despite the fact that additionality is not tested on a quantitative level, emission reduction related monitoring and verification are crucial for hard greening.

Firstly, monitoring and verification are the proof of the projects taking place as agreed between buyers and sellers and therefore constitute a crucial supervision tool of the greening activities. Secondly, the emission reduction calculation and verification is the basic information for evaluating the greening activities. Information on how much emission reduction was achieved is crucial for buyers to assess the greening effectiveness of the projects and thus their investments.

As for the modality of greening choice, most countries have a programmatic approach. Soft greening is included in most of the countries, except Hungary. In Ukraine, the soft greening is planned to take 25% of the total revenue after 2009. Given the total amount of AAU available in Ukraine, 25% will be a major amount of money, so the ramifications for transparency and emission reduction effectiveness are important.

For the modality of emission monitoring and verification, most countries have this function in GIS. However, Romania is going to have this particular modality completely missing as their approach is not based on emission reduction calculation and verification. Details of the monitoring in some countries are not clear yet at this stage.

It was pointed out that the detailed and rigorous M&V requirements are one of the primary obstacles towards energy efficiency projects in CDM and JI. Therefore a more flexible arrangement in GIS helps to ensure that more small- and medium-scale projects can be accommodated in GIS. Hungary's attempt at easing M&V as compared to Track-2 JI and CDM, but still providing the required evidence of emission reduction, is to apply the ISO 14064 GHG monitoring procedure in case of large-scale and complex projects within the GIS framework. The ISO procedure is similar in transparency to the procedures followed for JI, but can be executed in a more cost efficient manner. For small emission reduction interventions in the programmatic window of Hungarian GIS an even cheaper option is applied, which builds on the building certificate system of the EU and the connected energy balance calculation, thus making transaction costs less than prohibitive.

Table 11. GIS architectures in the countries with GIS in progress: modality choices and estimated GIS-based AAU supply³²

| | Hungary | Latvia | Ukraine | Czech Rep. | Romania |
|--|---|--|---|---|---|
| Estimated GIS-based AAU supply 2008-2012 | Up to 50 MtCO ₂ -eq | Up to 30 MtCO ₂ -eq | 100-1200 MtCO ₂ -eq | Up to 100 MtCO ₂ -eq | Up to 100 MtCO ₂ -eq |
| Greening option | Hard greening | Hard + soft | Hard + soft greening | Hard + soft | Hard + soft |
| Programmatic/project | Project + programmatic approach | Project + programmatic | Project approach | Project + programmatic | Project + programmatic approach |
| Budgetary option of the fund | Money goes directly to special account at Ministry of Environment and Water (MoEW) | Money enters budgetary account in state treasury, then disbursed to CCFI | Money enters a special account within the national budget | Money enters a special account under MOE, not entering the state budget | Revenues go into a special budget of the Environmental Fund or a Specialized Unit in the Ministry |
| Additionality requirements ³³ | Climate additionality: all GIS activities will result in quantified emission reductions, which are verifiable. Legal additionality: support in the areas where there is either no financing or other state or EU funding is available, but there is a need for producing additional emission reduction over what is mandated by requirements for other support. | No information | UKR wants to ensure additionality through projects in the areas which were not adequately addressed by JI (e.g. buildings sector, afforestation). In addition, UKR does not have international financing (such as EU structural funds), and national financing is not enough, so financial additionality is in place. | No information | Not applicable (the country has dismissed the notion of additionality altogether) |

³² See Table 9 for further details

³³ In the EU countries, under the directly applicable 1083/2006 Council Regulation the criteria for additionality to structural funds apply without additional country level legislation.

| | Hungary | Latvia | Ukraine | Czech Rep. | Romania |
|-----------------------------|---|---|---|--|---|
| Baseline | Programmatic windows – sectoral baseline Project window: TBD | TBD | Sectoral baseline; domestic version of CDM and JI methodology | Sectoral baseline & negotiation with the buyers | No baseline |
| Verification | Small projects: a) carbon efficiency calculation and desk review; b) a random check; c) after project realization check on performance of the applicant. Large projects: ISO standard employed. | TBD | Independent entity, most likely domestic, to issue determination report; a window for buyers' participation in M&V (but it is not legally warranted, as of November 2008) | Independent national auditor, most likely National Environmental Fund to perform M&V | No or simplified verification |
| Monitoring and verification | Financial audit; Reporting by the MoEW in the format of a report according to ISO 14064 standard; Advisory board monitoring of GIS overall. | Financial + project conformity; assessment of the greening result | Monitoring plan is proposed by the project beneficiary, no concrete rules on the monitoring are regulated at this stage | Yearly report which covers the monitoring of money, projects and results | Only monitoring of project implementation (in some cases simplified monitoring and verification of emission reductions) |
| Crediting period | Until 2020 in case of buildings related projects and end of 2012 in other cases | TBD | First commitment period | 15 years | Post-2012, no defined crediting period |
| Timeframe | First commitment period | TBD | First commitment period or beyond | TBD | Extended to next commitment period |
| Greening ratio | Not predetermined – will be established ex-post, but studies show efficiency and potential of measures | | Not applicable | 1:3 to 1:4 | Not applicable |
| Fund allocation | Grants | Grants | Grants | Soft loans and grants | Grants and soft loans |

| | Hungary | Latvia | Ukraine | Czech Rep. | Romania |
|-------------------------|---|--|--|--|--|
| Beneficiary | Non-profit co.; central and local authorities; NGO; physical persons; for second phase potentially private companies | Private Companies; non-profit co.; central and local authorities; NGO; physical persons | Private companies, government owned/ municipally owned companies | TBD, but preferably physical persons | Private companies, non-profit organizations, central and local authorities, NGOs, physical persons |
| Project selection | Tender | Tender | Tender and top down | Tender | Top down and tender |
| Priority areas targeted | For the pilot phase: Energy efficiency in residential and public sectors; renewable energy for heating; biogas production for transportation purposes; activities for reductions of non-CO2 emissions | For hard greening: energy efficiency in building sector; small scale RE; heat distribution in district heating systems; industrial power intensity. Soft greening: innovative low carbon technologies; capacity building for climate change policy design. | Housing and public utilities, reconstruction of district heating systems, forestry, water supply | Hard greening: retrofit of old building stock; promoting energy efficiency in buildings, energy efficient appliances; biomass for district heating. Soft greening: administrative procedures | Hard greening: rehabilitation of district heating systems; construction of small co-generation installations (non-ETS); recovery of methane generated by urban waste landfills; fuel-switching in energy productive installations (non-ETS); reducing non-CO2 emissions in industrial installations; energy efficiency in buildings (public and private); GHG emission reduction in agriculture and transports sector and forestry. Soft greening: TBD |

Currently, in most of the countries the greening ratio is not employed as a standard to regulate the greening. Buyers in most of the cases are provided with a list of projects as the greening options, rather than provided with a certain amount of emission reduction to be achieved.

In the Hungarian and Latvian GIS, the monitoring systems are structured in a similar format. The monitoring systems all consist of two parts. A) a financial monitoring plan, which is done through an annual financial auditing; B) a project performance monitoring plan, which supervises the conformity of the projects. Furthermore, the monitoring system as well as the financial records of the GIS are audited annually by international auditors.

Additionally, there is an advisory board that is typically composed of representatives nominated by the seller and the buyer and is to provide supervision over the scheme. This model can be copied and followed in other countries' GIS. Especially the advisory board consisting of people from the public sphere and NGOs can serve as an important supervising power for GIS in a hosting country.

Regarding the baseline for the GIS, most of the sellers chose the sectoral baseline and expect that the simplified methodology could be applied. In the case of the Hungarian GIS, in the housing sector a technical protocol is being developed for different characteristics of projects and a rating system for the housing sector is going to be employed.

Regarding the priority investment areas for greening activities, Table 12 lists the priority areas for investment as identified through the research.

Table 12. A list of priority areas for investment in GIS schemes being developed in CEE

| | Potential Greening activities | Country examples |
|---|---|-------------------------|
| Hard greening | Retrofitting old buildings | HU, LV, UA, CZ, RO |
| | Energy efficiency in buildings | CZ, RO |
| | Construction of small co-generation installations | RO |
| | Rehabilitation of district heating systems | CZ, LV, UA, RO |
| | Renewable energy (small scale) | HU, LV, RO |
| Soft greening (according to buy preferences ranking) | GIS management capacity building | CZ |
| | Capacity related climate change awareness | |
| | Monitoring and observation on climate system | |
| | Building capacity on climate-related legislation and policy | LV |

(Source: authors' survey)

Table 12 shows that hard greening activities are the priority areas identified by the majority of GIS host countries. Soft greening activities are identified by buyers according to their preferences. The table also demonstrates that most of the countries choose energy efficiency improvement as a high priority area. Retrofitting old buildings through measures such as improving thermal insulation, and energy efficiency improvement in appliances and lighting systems are a typical priority. This choice actually fills the gap where CDM and JI have largely failed.

5.4 Lessons learned from the case studies

5.4.1 Summary of the case studies

Hungarian GIS/Energy Efficiency in Buildings

Within this case study a GIS project in the field of EE in buildings as being implemented by the Hungarian government is assessed. The projects to be supported by GIS in Hungary will be selected according to certain criteria, namely cost-efficiency; climate and legal additionality; complementary nature of the funds. These criteria are predetermined by a hard greening option specified in the Hungarian law on GIS. However, to get one-to-one greening for certain measures in the housing sector, the crediting period might be extended beyond the first commitment period depending on the type of the project. In other sectors, which are similarly profitable regarding carbon savings but have smaller potential than the building sector and where projects will provide lower recovery, a subsidy (and not one-to-one scheme) is being planned.

At the same time, the modality option of soft greening should not be left out. It would be crucial to pay special attention to the publicity campaign regarding the implemented pilot projects. The Hungarian government is planning to make a provision for certain demonstrative activities such as billboards with information about the project, open days, on-line information, which will contribute to awareness-raising from other than GIS sources. These, in spite of their modest scale, might be considered as a small step towards soft greening.

The Hungarian GIS ensures legal and climate additionality. Climate additionality means that all GIS activities should result in verifiable additional emission reductions as compared to without the GIS funds. Legal additionality is defined as the greening activities not covered by measures mandated by legislation in force (Feiler 2008).

The funds received from the first AAU deals are supposed to be channeled to

the housing sector. As the residential sector is responsible for 30% of emissions, this potential might be captured by means of GIS. Energy efficiency measures in the residential as well as tertiary sectors are backed up by a number of national and EU subsidy systems. The GIS is planned to build upon these programs taking the form of so-called bonus or co-financing. This complementary nature of Hungarian green investment schemes overcomes many challenges created by some other modality choices, such as the additionality and cost-effectiveness criteria and may be well used to address the projects weakly supported by other policies. The reasons for the possibilities of such hybrid systems are twofold. Firstly, support schemes should always be compatible and strengthening each other. Secondly, a combination of support schemes allows for projects with higher emission reduction potential but having larger investment requirements or longer payback periods that make them bankable with the GIS revenues.

However, the GIS funding in Hungary will not cover 100% of project costs. It is already decided that the share of financing will be fixed as a certain amount in monetary terms to avoid supporting too expensive measures which might happen in case of a percentage share. Thus the Hungarian structure of the GIS subsidy stimulates more efficient investments, and this modality choice might be heeded by other countries. Such a modality option as subsidy scheme was predetermined by the experience in the Hungarian buildings sector: other financial schemes did not prove very successful.

Other GIS modalities are partly elaborated in the Government Decree which entered into force on 01.01.2008 and partly are still work in progress. According to the above-mentioned Decree, the approach to greening activities will be program-based for the first AAU deal (targeting residential and public sectors) and will be complemented by the project window afterwards. The program window will support small projects in a streamline way, bundling them together. This appears to be an agreeable approach to capturing the mitigation potential in the buildings sector. It might be recommended not to overburden this architecture modality with JI-like monitoring and verification procedures. As to the project window, it is supposed to stimulate innovation and new ideas giving incentives to the competitive sector. This modality option is planned to be similar to JI projects but less burdensome.

One of the main barriers of Joint Implementation projects is a cumbersome validation and verification of energy efficiency measures. Since a typical project in energy efficiency in buildings uses a combination of many measures, it is a formidable task to observe all the requirements. In addition, some measures are difficult to verify with methodologies provided by JI procedures.

Case study on bio-energy projects under GIS in Bulgaria

This case study assessed possible bio-energy projects under GIS in Bulgaria, the modalities of the project implementation and the institutional set-up. The analysis of the possible institutional set-up was based on expert interviews. It showed that existing institutional structures would have the capacity to manage a GIS. The National Trust Eco Fund or the Enterprise for Management of Environmental Protection Activities (EMEPA) would be capable to manage a GIS in Bulgaria. An independent consultancy, however, should be selected to support the GIS projects selection, the validation and the verification of emission reductions and spendings in order to ensure transparency, expert interviews concluded. Furthermore, it would be important to establish a secondary control over the spending similar to the control of the EU funds by a specially appointed deputy prime minister.

The case study revealed Bulgaria's large unexhausted biomass potential. During the last few years, the planned amount for harvesting was much lower than the real harvesting, which caused an unfavourable age structure of the forests, leading to potential losses of increment growth and other effects such as diseases, fires, disorder of wood stands, losses of regeneration potential, etc. The country could profit from a higher use of bioenergy not only through reducing GHG emissions but also through significant co-benefits, such as improved quality and productivity of Bulgaria's forests, increasing the security of energy supply, job creation in rural areas and decreased heating costs.

The report proposes two biomass related project types for GIS: (1) a programme for biomass-based heating of households and (2) a programme for using biomass for heating in municipal buildings. In both cases a programmatic approach is proposed, to be able to include a larger number of small entities in multiple sites in one single project activity and to have the flexibility that potential households not known at the onset, can participate.

The case study concludes that the project types discussed could be implemented easier under a GIS than under JI. This includes the fact that under a GIS a host country can subsidize projects with socio-economic co-benefits even if they are not as cost-efficient in terms of mitigation as it would be necessary under JI. Under a GIS, soft greening measures could be implemented which don't lead to quantitative emission reduction, but may be used to rise awareness or to increase the institutional capacity of the host country and therefore may reduce some of the implementation barriers so far faced in Bulgaria under JI.

Furthermore, when a large number of small units are geographically dispersed, such as in the case of households or municipal buildings, a programmatic

approach is more appropriate, which faces significantly more barriers under JI than under GIS.

Case study on GIS land-use and bioenergy options in Romania

The present case study gives an overview of suitable GIS project types in the land-use and bioenergy sector, such as the reforestation of cut but not regenerated private forest areas or the rehabilitation of district heating systems. The case study starts by describing the institutional requirements for establishing a GIS in Romania. The case study illustrates that land-use and biomass projects would bring about large socioeconomic co-benefits for the country. It then assesses concrete land-use and biomass project types, considering a range of implementation options.

Proposed land-use projects

The case study proposes two appropriate land-use hard greening project types:

- Support for improved forest management in “cut-not-regenerated” forests areas. The Romanian Law 18/1991 was the first step towards forest ownership restitution in Romania. Some of these forests have been cut over the period 1992-1998 and not regenerated. About 10,000 ha would fall in this category. The GIS activity would consist in support of planting of seedlings on forestland, what in current forestry terminology is “reforestation”, but where appropriate combined with assisting natural regeneration, possibly with enrichment with valorous tree species.
- Fast-growing crops. The proposed GIS activity would comprise woody fast-growing plantations for production of raw material for industry (i.e. pulp), biomass for energy production or biofuels may be included, possibly in integrated chain approaches: biomass production – energy/industry’s delivery chain. It may include biomass production of non-woody crops. In order to ensure complementarity with existing support schemes, the GIS projects would focus on types of woody crops which are not covered by the National Program of Rural Development (PNDR). The GIS would support projects of woody fast-growing crops with a rotation cycle longer than 5 years and include “non-energy” crops (i.e pulp for celluloses). The fast-growing crops less than 5 years old should be maintained with lower priority, as covered by PNDR measures.

The soft greening projects identified include an awareness program for initiating the establishment of a national shelterbelt system in drought affected areas of the country. The environmental benefits of the establishment of a national forest belt system would be considerable for local and regional environment,

agricultural production and socio- economical revenues for local population and infrastructures (i.e. roads, irrigation channels).

For the proposed GIS land-use projects a much simpler monitoring approach than under JI is proposed. The project types proposed fall at least for the forest land under the inventories which are periodically done by the forest administration. After a verification of the project implementation this could be the base for a simple monitoring over the project period.

Proposed GIS bio-energy projects in Romania

The proposed bio-energy projects include the construction of small co-generation plants (<7 MW with a total/partial substitution of fossil fuels and/or co-combustion). Biomass for electricity and heating could be especially valuable for small towns and villages that don't have the infrastructure for district heating. The other proposed project types are a fuel switch to biomass in several district heating networks and the replacement of fossil fuels in industry. The proposed bio-energy projects, however, could be implemented in general in a very similar way also under JI. However, as Romania implements JI Track 1 similarly to the Track 2 procedures, the potentially higher degree of freedom under JI Track 1 regarding Monitoring, Reporting and Verification (MRV) cannot be used. Implementing the proposed projects under a GIS could simplify the procedures and thus lower the transaction costs.

5.4.2 Conclusions for the project types and countries addressed in the case studies

Advantages of GIS compared to JI

JI Track 1 and international emissions trading, on which also GIS is based, have the same eligibility criteria. Track 1 JI gives the host country significant freedom regarding Monitoring, Reporting and Verification (MRV) and the definition of additionality, whereby it is in principle closer to GIS than JI Track 2. However, there is still a requirement for measurable and real emission reductions³⁴.

Whether a project may better be carried out under JI Track 1 or under GIS depends on the specific project type and the country. In Romania, and other CEE countries the adopted Track 1 procedures are similar to Track 2, as this alignment of JI Track 1 with JI Track 2 was required by a number of buyers of the credits.

³⁴ UNFCCC Document, Decision 9/CMP.1

- In contrary to JI Track 2, there is no strict additionality criterion under GIS. However, neither is there a formulated additionality criterion in the case of JI Track 1³⁵.
- JI (and CDM) failed to address projects involving a large number of small entities. The high transaction cost and time consuming procedures under JI didn't stimulate small-size projects, such as projects involving households. Under the CDM a programmatic approach was introduced but has limited success so far. While programmatic projects can be implemented also under JI, it is unlikely that they will play a large role in CEE countries, as JI is developed by the private sector which has little incentive to carry out complex project types if there is potential for more simple ones.
- Under GIS, longer crediting periods can be implemented. Also JI projects can make use of later crediting. Countries can enhance their JI crediting period through an AAU transfer representing the reductions after 2012. Late crediting is currently however allowed only in few CEE countries.
- GIS has specific advantages for land-use projects. CDM and JI restrict eligible land-use project types. In contrary, under a GIS any land-use activity is eligible; therefore the full potential of this sector can be exhausted. Under a GIS any crediting period can be implemented, while under JI a longer crediting period can only be implemented in the form of late crediting which is currently allowed only in very few CEE countries. Finally under GIS land-use projects, much easier and cheaper monitoring requirements can be applied than under JI. Under a GIS, forest indicators currently used by the forest administrators would be enough to assess the progress in activity performance.
- GIS will provide the revenues upfront. Some project types under JI/CDM suffer from the lack of upfront investments. CERs, or ERUs, however, are only generated when the project is already operational and in many cases the payment occurs after the delivery of the credits (see Sterk 2008). Land-use projects require large upfront investments and long crediting periods which lead to a delayed rate of return as trees need

³⁵ UNFCCC Document, Decision 9/CMP.1 provides for Track 1 JI "Where it is considered to meet the eligibility requirements set out in paragraph 21 above, a host Party may verify reductions in anthropogenic emissions by sources or enhancements of anthropogenic removals by sinks from an Article 6 project as being additional to any that would otherwise occur..."

several years to grow until they can generate a significant amount of credits.

- Paying for socio-economic co-benefits: The presented case-studies show that GIS projects may have a broad range of socio-economic and ecological co-benefits. Under JI, these co-benefits are not given a monetary value, but CDM projects can receive sustainability bonus in price. For instance, investments in building energy efficiency can yield a wide spectrum of benefits beyond the value of saved energy and reduced GHG emissions, such as health and comfort improvements, employment creation and new business opportunities, lower energy prices, energy security. This fact should be taken into account in particular for the projects which have relatively high mitigation costs. Buyers may accept a project with mitigation cost above average, but offering very important co-benefits. The latter are often not quantifiable, which is the reason why monitoring and verification under a GIS should not be focused on very strict quantitative assessments.

Need of simple institutional structures

A couple of studies have already assessed possible institutional structures for GIS (e.g. Andrej 2006, Worldbank 2004). Some of the proposed set-ups have a high degree of complexity and would need restructuring. Discussion with the concerned policy makers reveals that only simple institutional frameworks based on existing structures are likely to be put into practice. This is even more important in the case where governments are not yet convinced of implementing a GIS at all. The case studies conclude that the institutional structure for GIS should provide flexibility for both sellers and buyers of AAUs as well as for project developers to streamline the implementation of the scheme.

Soft greening needed – different according to GIS area and project type

Most of the proposed GIS project types will need a soft greening component for allowing an (efficient) project implementation. The share of soft greening needed very much depends on the area of action and the project types. Nevertheless, up to about 5% of the total project costs is mostly discussed as being acceptable. This is claimed to be an important criterion from the buyer's perspective and, as for example in the case of Romania, has been defined as a goal from the government's side as well. Generally we assume that a relatively high share of soft greening is needed in projects where a large number of actors are involved. This is, for instance, the case for land-use activities which largely depend on the awareness and willingness of private land owners which are only partly organised in associations. Other examples include biomass heating on

household level in Bulgaria and renovation of residential buildings in Hungary. In some countries, such as Bulgaria, soft greening may help overcome the institutional barriers faced under JI. It may be suitable to combine project types with different amounts of soft greening in “GIS packages” in order not to exceed the desired overall share.

Special fund for reaching a higher degree of transparency

A special GIS fund with annual international audit could serve to increase the transparency of the GIS processes in comparison with, for example, dedicated GIS funds in ministries. This is especially true for countries with a high risk of corruption. In addition, a separate system for the distribution of GIS funds might make the whole process of GIS project financing faster than is the case with the state budget financial flows.

Table 13. Interaction between modality options and priority investment areas

| Modality for operation | Modality options | Priority area for investment | | |
|------------------------|--|---|--------------------|----------------------|
| | | Retrofitting buildings | Bioenergy projects | CC awareness raising |
| Fund allocation | Grants | ++ | + | ++ |
| | Soft loan | ++ | ++ | -- |
| | Credit guarantee | ++ | ++ | -- |
| Beneficiaries | Central and local government | ++ | ++ | -- |
| | Government owned / municipally owned companies | ++ | ++ | -- |
| | Private companies | -- (Violation of the state aid rule) | + | ++ |
| | Non-profit companies | + | + | ++ |
| | NGO | -- (don't have the capacity) | -- | ++ |
| | Physical person | ++ | ++ | ++ |
| GIS timeframe | First commitment | ++ | ++ | ++ |
| | Late crediting | -- (if credit guarantee is chosen as fund allocation option) | + | -- |
| Crediting period | 5 yr | -- | -- | / |
| | 10 yr | -- | | / |
| | 10 or more | ++ | ++ | / |

| | | | | |
|-------------------|-----------|----|----|----|
| Project selection | Top down | ++ | ++ | -- |
| | Bottom up | -- | -- | + |
| | Tender | ++ | ++ | + |

6 Conclusion

GIS could potentially become a significant alternative carbon finance mechanism to presently existing ones in the CEE region, especially joint implementation, and could be the testing ground for a potentially superior future global climate change mitigation flexibility mechanism compared to existing ones.

The dynamics of development in green investment schemes has been extremely fast during the past 2-3 years, having progressed from an early consideration level to completion of several first transactions in fall 2008. At the same time, the remaining window for first generation GIS is also closing fast: the architectural design, the legal framework, the negotiations, the completed transactions, and potentially all revenues disbursed and investments implemented from them, or possibly even most emission reductions – all have to be completed by 2012. This dictates a particularly ambitious schedule, considering that there is little research and preparatory work on this new carbon financing instrument.

There are no international legal regulations regarding GIS (as opposed to the very large body of regulations and EB decisions for CDM, for instance), and thus the way GIS can be set up is extremely flexible: it only depends on the buying and selling countries. This substantial flexibility, especially as compared to the other KP flexible mechanisms, offers major new opportunities: it could potentially “correct” the shortcomings of other carbon finance mechanisms. However, this flexibility also poses significant risks: environmental integrity is harder to assure without the robust international legal and institutional frameworks designated for this purpose.

The purpose of this report was, therefore, to investigate how this flexibility can be best utilized for maximizing GIS’s benefits to climate and society, but also to ensure that its environmental integrity is not compromised at the expense of its simplicity and flexibility. It achieved this through two main processes: on the one hand, it investigated the shortcomings of existing carbon finance mechanisms (mainly JI and CDM) and drew lessons for how GIS could overcome those; and on the other hand, applying these lessons and other criteria, it investigated how GIS schemes can be designed in order to ensure environmental integrity and maximize their benefits for the climate in the long-term.

The assessment of the experiences with JI and CDM revealed a few important lessons for GIS. First, JI and CDM have largely failed to deliver in mitigation

areas with the highest sustainability benefits, which are also especially important mitigation priority areas in CEE. These areas include, but are not limited to, building energy efficiency, small- and medium-scale bioenergy utilisation. These areas not only have very significant mitigation potentials in CEE (proportionally much more than in other world regions), but also have substantial social, political and economic co-benefits, including improved social welfare, fuel poverty reduction, increased value of real estate, new business opportunities, employment creation, and reduced energy dependence.

The study concluded that it would be detrimental for GIS to “copy-paste” CDM/JI³⁶ architectures in its modality design since in this case GIS may also fail in these high-priority areas. The report found that while ensuring additionality and thus monitoring and verification are fundamental for the environmental and financial integrity of GIS, applying simpler approaches to M&V and additionality enforcement than in CDM is essential. While the model of programmatic CDM may partially be applied, it is important that some restrictions of pCDM are not transferred, such as limiting a programme to focus on one type of emission reduction only.

The study went on to analyse the different modalities of GIS architectures, and their impact on GIS regarding climate effectiveness. Learning from the lessons from CDM/JI as well as other constraints related to GIS, the following selected recommendations can be made for GIS architectures. Table 14 summarises the main lessons learnt for the choices in various modalities. The text below details a few of these that have particular importance for climate effectiveness.

First, in order to ensure environmental integrity through additionality but avoiding the pitfalls of CDM in this regard, **simpler and innovative approaches are needed to ensure additionality**. For instance, the Hungarian GIS is set up in a way that it provides finance only for investment types that would not take place in absence of GIS funding but are important for climate. For instance, building retrofits are supported through GIS to efficiency levels that are not attractive under other financing schemes, but lay the foundations of a low-carbon future building stock.

On the other hand, the *lenience towards additionality* by many host countries, such as Romania, is a worrying trend. So far no CEE GIS schemes legislated that revenues are to be spent on investments that are additional (although EU member states are subject to certain additionality requirements by EU law, but these are not sufficient to ensure climate additionality), and some countries even announced that additionality is not an important criterion in their GIS. The realization of such trends raises significant environmental concerns about GIS.

³⁶ Track 2

In general, the study pointed out that GIS, as it stands today, provides a unique, one-time opportunity for significant funds for abatement investments. Therefore, the report showed that **an optimal way to use these revenues is to target these towards areas which are not easily reached by business-as-usual investments**, and policies in place or in the pipeline, **but that are fundamental for a long-term low carbon economy** in the host countries. Such areas in CEE include **infrastructure-related investments**, such as **the retrofitting of the building stock** or ensuring that new buildings have very low carbon footprints, and certain bioenergy projects, such as biomass-based heating. However, these typically have very long payback times, and these have important implications on GIS architecture optimality.

If such long-term climate investments are to be accommodated in GIS, it is crucial that the combination of allowable crediting period, greening ratio and AAU sales price ensures adequate bankability for long-term projects. In case the crediting period does not account for emission reductions earned beyond the end of the first commitment period, and a strict 1:1 greening ratio (or close) is required, with current ranges of AAU prices this will severely limit the investment types to picking the very low hanging fruits – that is typically already taking place by JI or other policies/mechanisms. Therefore, **a realistic post-2012 crediting period** (such as until 2020) **is important** so that GIS can accommodate investments that determine long-term emissions and are not taking place without GIS.

Finally, an important bottleneck in first generation GIS posed by its short window of opportunity remaining is its capacity to expend its revenues. **Fund disbursement and administration can present serious challenges for the magnitude and effectiveness of GIS schemes in general.** This is compounded by the general challenge of initiating and starting up a new scheme and financing mechanism that all require time for a full-scale operation. This is especially the case for schemes that have a bottom-up disbursement approach, i.e. those that require projects to be initiated and proposed by investors. This problem can be partially addressed by utilizing existing and well-known funding schemes and institutional structures as much as possible, but typically other funds were set up for different purposes and therefore they may not cater best to meet the goals of GIS.

The study also investigated the advantages and disadvantages of GIS as compared to alternatives, such as Track-1 JI that is very similar for the selling and host countries. The report concluded that GIS, if well designed and operated, can offer significant climate advantages over JI. **GIS accommodates longer-term horizons and allows governments to place emphasis on areas where early investment is crucial for the transition to**

a de-carbonized economy in the long-term and which require ambitious actions. While JI became a cumbersome and difficult mechanism, **GIS offers opportunities for state-induced emission reduction activities which can target emission reduction areas of strategic importance.** State involvement can provide for a much larger organizational structure of program coordination than what traditional carbon-market actors are ready for and it can also manage, with careful organization, the limitation of transaction costs, which might be prohibitive in the case of JI-type operation.

In addition, GIS offers an opportunity for small-sized projects as opposed to JI. While programmatic approaches can also be implemented under JI, it is unlikely that they will play a role in CEE countries, as JI is developed by the private sector which has little incentive to carry out complex project types if there is potential for more simple ones. In addition, JI is practically inoperational in EU member states due to the linking directive. GIS can also fund those very important climate mitigation target areas that are prohibited in JI because of their interaction with the EU ETS. Furthermore, since most countries implement their JI Track 1 rules similarly to Track 2 provisions, the freedom that a country can have under JI Track 1 in theory regarding MRV cannot be exhausted. More freedom regarding MRV under a GIS can lower transaction costs and allow effectiveness in high-priority target areas that MRV requirements of JI have severely affected.

The report also conducted in-depth case studies on GIS in the building sector energy efficiency in Hungary, biomass in Bulgaria and LULUCF in Romania. In the areas investigated by the case studies, GIS could have a major role for exhausting greenhouse gas reductions which have not been captured by existing instruments, such as JI. A special strength of GIS is the flexibility regarding project types and implementation.

The report pointed out that **EU member states might consider adopting an EU-wide guideline on the preference towards purchasing AAUs from another member state**, all else equal. This is because total EU investments into AAUs are likely to run in the order of magnitude of € 3.8-4.0 billion, and if these funds are invested in other EU member states on climate mitigation, this will help the EU comply with its post-2012 commitments³⁷.

The overall market potential for AAUs is estimated to be long by 1.3 Gt/year, summing up to 6.5 Gt over the first commitment period. The main reason for this surplus is that Russia, Ukraine and a number of other EIT are expected to emit much less GHG than it was the case in 1990, which makes these countries potential sellers of AAUs. The most important players on the buy side are Japan, Spain and Italy, with emerging demand from New Zealand. In the outset, gross

³⁷ Assuming that mitigation-related investments will be in long-lifetime projects, such as infrastructure or other long-lifetime capital stock.

demand under the Kyoto Protocol amounts to 557 Mt/year, excluding potential demand from Canada.

In order to affect the market and prices, the surplus has to become available to the buyers. Recent developments show that in this respect the market is starting to become more substantial. As of 2008, several transactions have already taken place, Memoranda of Understanding are being signed and contract templates are being developed.

One of the reasons for relatively slow development of the market is a wide spread between sellers' and buyers' perceptions of a fair AAU price. According to the estimates as of November 2008, the equilibrium price might approximate € 10 per ton of AAU, which is lower than it had been expected even a month before due to the influence of the financial crisis on carbon prices. In view of slumping prices, there have been reports of delays of planned AAU sales. The value of the AAUs expected to be transacted could be in the range of €9 billion. For most of the seller countries this would be a major revenue stream that could be helpful for financing much needed infrastructure upgrades, etc.

It appears likely that the GIS/AAU market will grow at a modest pace. So at least for the next couple of years, it seems likely that the GIS/AAU trade will constitute a relatively small share of the global carbon market, being characterized by low liquidity and hampered by institutional constraints.

However, the significance of GIS runs beyond the first commitment period. If the experiences prove to be positive, **GIS could potentially become the model** for a **superior carbon finance mechanism**, or for one that fills in important carbon market niches. Its experiences could be directly transferred or indirectly utilized in post-2012 flexibility mechanisms, used as a model to finance climate activities in developing countries, or to disburse climate funds such as the auctioning revenues from EU ETS.

Table 14. Summary recommendations for GIS architecture design modalities, in order to optimize their impacts for climate and society

| Modality category | Issues in modality choice and recommended modality, if applicable |
|--------------------------------|---|
| Greening option | Dominance of hard greening is required to ensure climate effectiveness. A small share of soft greening can be important to facilitate the effectiveness of the hard greening part, but this should be a minor share to avoid potential risk of misuse, since ensuring the integrity and effectiveness of spendings through soft greening is difficult. |
| Programmatic/ project approach | A purely project-based approach may compromise GIS in areas where small and dispersed investments are needed such as end-use efficiency or small-scale renewables, because of transaction costs. A programme-based approach has lower transaction costs and can have larger scale roll-out. |
| Budgetary option of the fund | Due to relatively low financial discipline and major budgetary problems of CEE host countries, it is important that revenues enter special accounts from which the money cannot be legally paid out on other spendings. |
| Additionality requirements | Additionality is essential for ensuring the environmental integrity of GIS. 3 types: financial, legal and environmental. Some financial additionality is mandated for EU member states, but not enough to ensure environmental integrity. Additionality should ideally be stipulated in GIS legislative framework, but at least by ensured by the scheme setup. Rigorous quantitative additionality enforcement, on the other hand, may be counter-productive for many areas of high priority for GIS in CEE. |
| Baseline | Sectoral baselines rather than individual baselines substantially reduce transaction costs and can overcome methodology problems. |
| Monitoring and verification | M&V are essential for ensuring the environmental integrity. They are a crucial supervision tool and the proof of the projects taking place as agreed between the buyer and seller. However, rigorous M&V as in CDM could kill GIS in important priority target areas. Simplified, innovative M&V methods are suggested, such as calculations confirmed by random checks, using ISO standards, etc. |
| Crediting period | Allowing post-2012 crediting is important in order to avoid that GIS only picks the low-hanging fruit. If, however, flexibility is applied to the greening ratio, or AAU prices are high, or substantial co-funding is applied, long-term investments may still be bankable. |

| Modality category | Issues in modality choice and recommended modality, if applicable |
|--------------------------|---|
| Timeframe | Normally transactions will be allowed only in the 1 st commitment period. However, extending the timeframe for funds disbursement would be important for optimizing climate effectiveness. The remaining time is too short for a careful scale-up of funding schemes, and disbursement capacity will either be a serious bottleneck limiting the total volume of GIS, or the climate effectiveness will be jeopardised if funds are spent compromising the optimal framework in order to expedite disbursement. |
| Greening ratio | 1:1 ratio would be ideal, but may not be feasible (too narrow circle of enabled investments) if the crediting period does not extend beyond 2012 or there is no co-financing. |
| Priority areas targeted | Due to the one-time window of opportunity, high-priority climate abatement areas not easily targeted by business-as-usual activities and policies are ideal target areas. These often include low-energy infrastructure determining long-term emissions, but typically associated with long payback times (buildings, transport). Societal co-benefits for host countries can also be maximized. In particular, in CEE attractive areas that fall into these categories include: energy efficiency in residential and public sectors; renewable energy for heating; biogas production for transportation purposes, other small-scale bioenergy investments, LULUCF if applicable in host country. |

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Annex 1.

Eligibility requirements to participate in GIS

Absolute Legal Requirements:

Both buyers and sellers on country level need to satisfy all eligibility requirements to participate in the international emissions trade under the Protocol, the Marrakesh Accords and subsequent decisions, such as Decision 18/CP.7: “Modalities rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol” (the **Kyoto Rules**).

Legal Requirements to participate in IET on state level:

- (i) Be a party to the Kyoto Protocol.
- (ii) Have its assigned amount calculated and recorded.
- (iii) Have a national system to estimate emissions and removals.
- (iv) Have a national registry.
- (v) Have submitted the most recent annual inventory.
- (vi) Submit supplementary information on its assigned amount.
- (vii) Satisfy required mandatory set-aside requirement.
- (viii) In case of country with JI projects, it needs to make sure that the needed AAUs will be available for conversion to ERUs (for planned JI projects). Thus by calculating the available AAU amount for sale, the AAUs that will be converted to ERUs cannot be taken into account.
- (ix) In case country aims to bank AAUs to next commitment period, these AAUs cannot be part of amounts for sale under IET in this period either.

Additional legal requirements under the EU ETS:

As AAUs are converted to EUAs, countries part of the EU ETS may only sell surplus that is not converted to EUA (EUAs once converted can only be transferred back to AAUs under limited conditions) (EC 2004).

Additional legal requirements for entities:

Under Article 17 of the Kyoto Protocol, entities may be authorized to take part in the IET of countries which are eligible to be part of the IET themselves, too. The mode of the authorization and specific rules on this article are regulated on national level (with certain specific criteria in relation to JI and CDM).

AAUs, under specific conditions of the national legislation, may be bought by entities too, but as AAUs can only be used by Kyoto parties to fulfill their international obligations, even though entities can hold them and trade with them, their purpose is limited and state related.

Table 15. Possibility of holding AAUs by legal entities: Options set out in the EU ETS³⁸

| COUNTRY | EU ETS OPERATOR ALLOWED TO HOLD AAU | NATURAL PERSON ALLOWED TO HOLD AAU |
|-----------------------|---|--|
| <i>Austria</i> | NO | Generally NO, Ministry may grant exception |
| <i>Belgium</i> | | |
| <i>Bulgaria</i> | | |
| <i>Cyprus</i> | | |
| <i>Czech Republic</i> | YES | YES |
| <i>Denmark</i> | YES | YES |
| <i>Estonia</i> | NO | NO |
| <i>Finland</i> | YES – with permission from Ministry of Environment | YES – with permission from Ministry of Environment |
| <i>France</i> | | |
| <i>Germany</i> | NO – Ministry may grant exception | NO – Ministry may grant exception |
| <i>Greece</i> | | |
| <i>Hungary</i> | NO – permit can be granted by Ministry of Environment to hold Kyoto units | NO |
| <i>Ireland</i> | NO | NO |
| <i>Italy</i> | | |
| <i>Latvia</i> | NO | NO |
| <i>Liechtenstein</i> | YES | YES |
| <i>Lithuania</i> | YES | YES |
| <i>Luxembourg</i> | | |
| <i>Malta</i> | | |
| <i>Netherlands</i> | NO | NO |
| <i>Poland</i> | NO | NO |
| <i>Portugal</i> | YES | YES |
| <i>Romania</i> | NO | NO |
| <i>Slovakia</i> | YES | YES |

³⁸ Based on data available at <http://ec.europa.eu/environment/climat/emission/pdf/holdingofunittypes.pdf>

| | | |
|-----------------------|-----|-----|
| Slovenia | NO | NO |
| Spain | | |
| Sweden | YES | YES |
| United Kingdom | YES | YES |
| Norway | YES | YES |

As set out in the table, in most of the member states EU ETS operators³⁹ and in some countries even natural persons can hold AAUs in their accounts. In practical terms, companies subject to ETS allocations would in principle be interested in Kyoto credits as their price is presently lower than EUAs.

However, AAUs can not be transferred to the EU ETS system under the current rules, thus even in countries that allow holding of AAUs to operators or to national persons, it is highly unlikely that these entities would be interested in buying AAUs.

In the EU ETS there is not much motivation to buy AAUs by private entities as they can not transfer them to EUAs. Thus, the most likely purchasers of AAUs under IET (/GIS) in the EU are countries (and not entities) that need additional AAUs to meet their Kyoto commitments.

³⁹ Operator is defined by the EU ETS Directive (2003/87/EC) Art 1 (f) as **any person** who operates or controls an installation or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of the installation has been delegated (thus in theory this could also include natural persons, but in practice operators of the EU ETS are companies – legal and not natural persons).

Annex 2.

GIS and EC state aid rules pertaining to environmental aid

Aid that is provided by responsible bodies of a member state or the member state itself which may have the potential to distort competition and trade between member states, is incompatible with the European Treaty under Article 87 EC Treaty.

Whilst the European Treaty sets out that aid which distorts or threatens to distort competition and trade between member states is incompatible with the common market, there are circumstances in which State aid may be allowed, such as the promotion of environmental protection.

Community Guidelines on State Aid for environmental protection

The objective of State aid control in the field of environmental protection is to ensure that State aid measures will result in **a higher level of environmental protection than would occur without the aid** (this principle can be understood as the additionality requirement).

Generally, state aid is present where a measure is provided from state resources (e.g. grant, grant in aid, subsidy) by a member state or other public body and is given to an undertaking engaged in economic activity. The GIS schemes fall under the definition of state aid in Article 87, but it is exempt by the Community Guidelines on State Aid for environmental protection. However, each member state implementing the GIS has to remember that this is not an absolute exemption and if the aid potentially has an effect on competition or trade, then it will fall under the state aid rules and may be found to be unlawful.

Possible state aid violations of GIS:

1. Cross subsidization

The GIS schemes have different options that a country could choose to implement its scheme. As to how the funds are earmarked or the budgetary option, to reduce the resulting distortions on trade, there should be a separation

of accounts in order to avoid cross subsidization from one market to the other, i.e. either a state special budget or an extra budgetary fund.⁴⁰

Cross-subsidization occurs when a firm, often a public monopoly, with dominance in one market, uses the resources gained to try to establish dominance in a competitive market. This usually happens in situations where there are some common costs. If the costs of the different activities are separated, it is easy to prove that the losses in one activity are compensated by the profits in the other activity (Article 92 of the EC Treaty).⁴¹

2. GIS as a possible barrier to trade

Areas that are a priority for GIS schemes in CEE countries are 1) improving energy efficiency, more specifically thermal retrofitting of the old building stock, and 2) biomass-based heating, especially on a small-scale. Both these priorities are within the boundaries of the Environmental Guidelines. However, the countries implementing GIS schemes should be cautious with priority number 1 because retrofitting of old buildings is large scale and some service providers cannot invest in this undertaking due to their small size. This may be seen as a barrier to trade that would distort competition, thus bringing it under scrutiny of the Commission. A solution for this barrier could be for the government to offer the project to the potential service providers through an anonymous reverse auction. Reverse auctions give smaller service providers an opportunity to get the project by anonymously submitting a bid on their own terms and the government awarding the project can choose amongst all the bids that it receives. This gives all bidders an equal chance of winning the contract.

⁴⁰ *Commission decision Deutsche Post AG of March 20, 2001*: The decision clarifies the costs to be covered by a multi-product monopoly operator offering an additional line of products in a market open to competition. The market concerned was the one of mail-order parcel services in Germany, as distinct from over-the-counter parcels and business-to-business parcels. Although open to competition, it is a market on which Deutsche Post holds a dominant position, being the only operator of nationwide infrastructure with a stable volume share of more than 85 percent of the market. The decision sets a standard for measuring the cross-subsidies between letter monopoly area and competitive activities that result in predatory prices in the latter. In fact, it distinguishes between costs for network capacity and network usage. While the former are treated as common fixed costs, the actual costs for network usage are deemed to be variable or incremental costs.

⁴¹ *Extension of procedure for State aid No C 16/2004 (ex CP 71/2002 and CP 133/2005): Alleged State aid from Greece to Hellenic Shipyards SA*: The Commission had doubts regarding the State aid nature and compatibility of the following measures which had not been notified by Greece: Cross-subsidization between Hellenic Shipyard's military and civil activities. Hellenic Shipyards was getting the aid and using the funds received for its military activities and using it to fund some of its civil activities.

3. *Different legislative nature of AAUs as a potential distortion of trade*

The suggestion that some countries (such as Romania) are considering allowing private buyers to buy AAUs could give rise to state aid/competition issues. This situation can be seen in certain cases as though the government selling the AAUs confers an advantage to the recipient on a selective basis, for example to specific companies or sectors of the industry, or to companies located in specific regions. Generally, aid for environmental protection given to a beneficiary with substantial market power may be used by this beneficiary to strengthen or maintain its market power. In this case, the Commission will assess the beneficiary's market power before the aid is granted, and the change in the market power which is expected as a result of the aid.

Hungary has very complex legal rules on various state aid options under GIS and is in line with the Community Guidelines on state aid for environmental protection. As it has implemented fully the guidelines and the modalities of the GIS scheme, it can be a model for other countries which are in the process of implementing their own GIS schemes.

It has to be taken into account though that state aid rules need to be respected not only when drawing up the model, but also later on a case by case basis, when granting the various types of aid.

Based on the EU state aid rules described above, countries need to make sure that the aid measures will result in a higher level of environmental protection than would occur without the aid, to ensure that the positive effects of the aid outweigh its negative effects in terms of distortions of competition, and no cross-funding will take place. They also need to ensure that protection given to a beneficiary with substantial market power will not be used by this beneficiary to strengthen or maintain its market power. In case these rules are not taken into account, the country can easily violate EU state aid rules and thus risk a possible infringement procedure.

Please note that the aid has to be approved on a case by case basis. Statistically, the Commission approves 85% of all notified state aid measures after a preliminary assessment. It only takes a formal decision on contentious cases (i.e. cases that could possibly distort competition).

Commission's power under State Aid rules

Following the formal investigation procedure as laid down in Article 6 of Regulation (EC) No 659/1999, the Commission may decide to close the procedure with a decision in accordance with Article 7 of that Regulation. If the

European Commission finds unlawful aid to be incompatible with the principle of fair competition on the internal market and in violation of EU law, it has the authority to force the member state to abolish the measure and to recover the aid from the beneficiary to restore the situation which existed before the aid was granted.

Annex 3. Risks in GIS and their impact on modality design

Table 16. Risks in GIS and their impact on modality design

| | Reason | Mitigation | Implication on modality design |
|--|--|---|--|
| Greening activity delivery risk | Project not implemented; not enough credit generated | Contract delivery | Monitoring and verification of ER, additionality criteria |
| AAU transferability risk | Doesn't meet eligibility criteria for IET (All potential GIS host countries however except Bulgaria are currently eligible); mal-management of AAU | Ensure the eligibility criteria are met; National AAU management plan | Institution arrangement to ensure that the AAU management is efficient, AAUs legal personality under national legislation allows "user friendly" sale arrangements |
| AAU oversell | Mal-management of AAU | National AAU management plan | Institution arrangement in the GIS system, stringent follow up of relevant Marrakech Accords and where applicable EU ETS rules |
| Price risk | Market uncertainty | | None Even though GIS on its own mitigates to a certain degree the price risk, as it generates an additional value for the AAUs by greening them. |

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