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Green Investment Schemes:

Maximizing their benefits for climate and society

Synthesis Report

PROJECT LEADER

Diana Ürge-Vorsatz, Center for Climate Change and Sustainable Energy Policy, Budapest, Hungary

AUTHORS

Andreas Türk, Joanneum Research, Graz, Austria
Maria Sharmina, Central European University, Budapest, Hungary
József Feiler, Office of the Parliamentary Commissioner for Future Generations, Hungary
Liming Qiao, Central European University, Budapest, Hungary

With Contributions from:
Kristian Tangen, Point Carbon (carbon market facts)
Györgyi Gurbán, European Commission[1] (legal perspectives)
Dorian Frieden, Joanneum Research, Graz, Austria

[1] The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission

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Contact Details:
Managing Director: Jon Price
Climate Strategies
c/o University of Cambridge
13-14 Trumpington Street
Cambridge, CB2 1QA, UK

Office: +44 (0)1223 748812
www.climatestrategies.org
jon.price@climatestrategies.org

The Executive Summary, Synthesis Report and Full Report of 'Green Investment Schemes: *Maximizing their benefits for Climate and Society*' can be downloaded from:
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The following Country Case Studies are also available for download from:
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- Green Investment Scheme: Case Study on Hungary. Sharmina, M., Urge-Vorsatz, D. & Feiler, J.
- Options for GIS Bioenergy Projects Under GIS in Bulgaria. Tuerk, A. & Frieden, D.
- Options for Land-Use and Bioenergy Projects Under a GIS in Romania. Tuerk, A., Frieden, D. & Blujdea, V.

Abbreviations

AAU	Assigned Amount Unit
CCFI	Climate Change Financing Instrument
CDM	Clean Development Mechanism
CEE	Central and Eastern Europe
CER	Certified Emission Reduction
CO2e	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
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

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Synthesis report

1 Introduction

Green Investment Schemes, a new carbon finance mechanism, could potentially become a significant alternative to presently existing ones in the CEE region, especially joint implementation, and serve as the testing ground for potentially superior future global climate change mitigation flexibility mechanisms compared to existing ones or for ones that fill in present niches in the domain of climate change action financing. At the same time, the remaining window of opportunity is 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.

The Green Investment Schemes (GIS) have been introduced to ensure the climate effectiveness of international emission trading (IET) involving first commitment period excess assigned amount units (AAUs) in former communist countries for the purpose of complying with the Kyoto commitments of other Annex I countries.

The Central and Eastern-European (CEE) countries, together with Russia and Ukraine have app. 57.8 billion surplus AAUs (Point Carbon 2008) for the first Kyoto commitment period. While these could be utilised through IET by Annex I countries to meet their targets, 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 by purchasing surplus AAUs that are not the result of real emission reduction activities (Gorina, 2006; Carbon Finance at the World Bank, 2006). In order to bridge this gap, GIS is established to unlock the surplus AAUs in the region for Annex I compliance, as well as to leverage the potential financial revenues from such sales for climate benefits in CEE countries (Tangen et al, 2002; Blyth and Baron, 2003).

From a legal perspective, GIS is a self-imposed binding commitment by the potential seller countries, to fulfill the conditions of the potential buyers. As there is no international requirement on how to model the GIS, countries have major flexibility in drawing up their schemes. This substantial flexibility 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.

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 in the approximate order of € 9 billion if we assume a price of €10/t[2]. This could dwarf 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.

Due to the 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. At the same time, the body of research and preparatory work on GIS is dwarfed by that on other carbon mechanisms. Due to a lack of research and experience on GIS, exacerbated by the more significant risks and opportunities resulting from the lack of international regulation on GIS, significant cooperation and careful planning are required to unlock the real benefits of GIS for climate and the societies of the selling and buying parties.

2 Aims of the study

The purpose of this report is, therefore, to investigate how this flexibility in GIS 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. This purpose is reached through two main processes: on the one hand, it investigated the shortcomings of existing carbon finance mechanisms (mainly JI and CDM) and drew lessons how GIS could overcome those. 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. As part of the latter, the report reviews the developments in GIS in the different CEE countries and characterizes their GIS architectures in the making, and analyses three case studies in depth.

[2] 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.

Carbon finance mechanisms can be observed and assessed from many perspectives. In harmony with the mission of Climate Strategies, the overarching aim 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. 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.

3 History and future opportunities for GIS

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 several completed first transactions in fall 2008. In June 2007, the Hungarian parliament has approved the pioneer national law on GIS implementation, and had secondary legislation in place by the end of 2007. As of October 2008, Latvia also had the legal framework and institutional system in force. The Czech Republic, Ukraine and Romania have adopted general legislature on GIS. Bulgaria and Poland demonstrate a strong interest in the development of the scheme. 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, 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.

Another advantage of this “virgin” nature is that GIS, having been shaped only during the past few years, 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. We refer to post-2012 GIS as second generation GIS, indicating that, while it would build on the basic concept

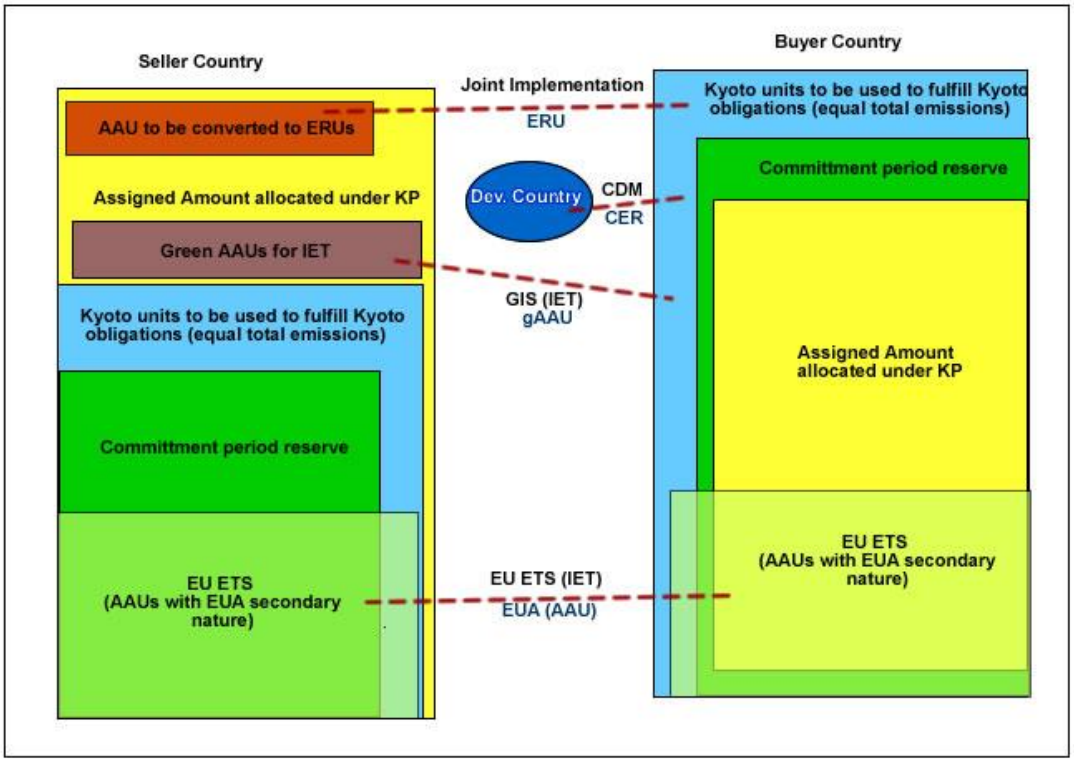
of first generation GIS until 2012, its legal foundation could be extended from the Kyoto Protocol, and as well as its revenue sources.

4 Description of GIS and architectural modalities

4.1 Details on GIS and stakeholders involved

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 revenues from their sale. While IET is regulated by the Kyoto Protocol, the Marrakesh Accords and the COP/MOP decisions, the domestic greening activities are not covered by international regulation. Figure 1 reviews how GIS fits among other carbon transaction types and greened AAUs relate to other carbon assets.

Figure 1. 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.



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. As of November 2008, only Japan allows for legal non-governmental entities to purchase AAUs, while New

Zealand is preparing an authorization for companies to participate in its emission trading scheme.

4.2 Prioritisation of target areas to be supported by GIS

As highlighted above, the potential revenues through GIS are significant for the host countries, especially in the light of historic funding sizes for climate related activities in this region. This fact, combined with other characteristics of first generation GIS, influences the choice of priority target areas for GIS spendings. These characteristics include that first generation GIS is likely to be a unique source of carbon finance, not likely to continue after 2012 in its current form. At the same time, there is likely to be a significant oversupply of (greened) AAUs on the market during its operation. 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.

These characteristics lead to the following suggested criteria for the determination of priority GIS target areas:

- On a buyer's market, the buyer's preferences are extremely important to observe. Among these, the report found that the **assurance of the environmental and climate integrity** of the scheme is the most fundamental one, followed by the priorities on price and achieving **maximized climate benefits**. Environmental integrity is assured through the **additionality** of the investments.
- Maximizing gains **towards national social, political and regional development priorities** (i.e. maximizing co-benefits).
- 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 satisfy additionality. This is especially important in EU member states or other countries with ambitious GHG reduction targets that already have many policies and mechanisms in place to reduce emissions significantly. In such countries the one-time GIS revenues could be spent on targeting investment areas crucial for a low-carbon economy in the long run, but that are hard to reach by other policies/measures.
- **Practical feasibility, dispensability** and **transaction costs** of the given GIS model in the chosen target sector.
- **Transparency** and **accountability** regarding GIS operations, along with other safeguards for buyers (e.g. third party audits).

Since GIS revenues represent a rare, one-time, but potentially significant window of opportunity for mitigation financing, this report argues that **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,** rather than towards capturing the 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 by this report, this will maximize societal 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.

Additionality requirements could exclude some areas from GIS support, or make GIS support in those areas much more difficult. For instance, in the EU, 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 EU host countries, GIS has the advantage as compared to JI that the so called double-counting rules of the Linking Directive (2004/101/EC) do not apply for GIS. Therefore GIS can fund investments directly or indirectly affected by the ETS, constituting the lion's share of the emissions, and, more importantly, the significant mitigation potentials in the CEE countries.

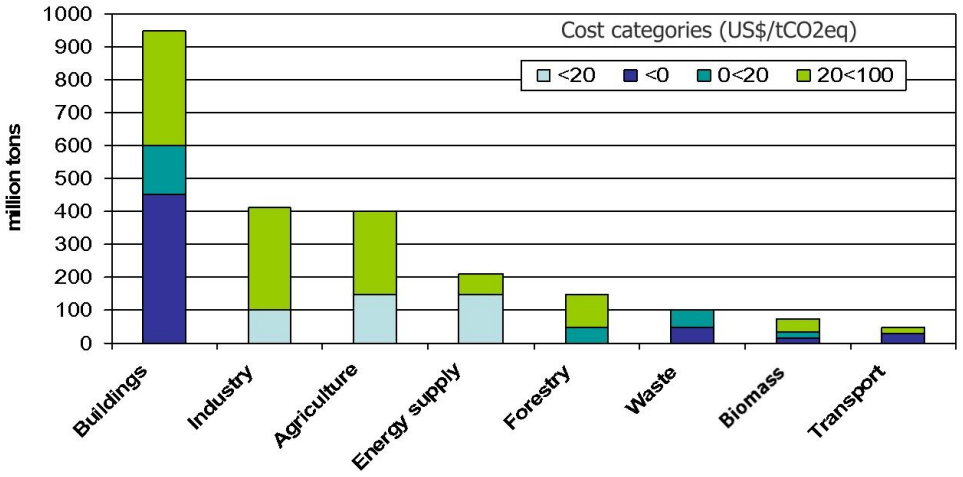
Before identifying some concrete areas for priority target areas, the report reviewed the mitigation potentials in the EIT region. As Figure 2 demonstrates, by far the largest cost-effective potential is in the buildings sector; that amounts to as much in the cost-effective category as all other sectors combined. 37% of emissions in this region can be avoided at a net profit. This is larger than the world average of 29%, mainly because of the poor state of the building stock and lack of historic incentives for efficiency. In terms of renewable energy, bioenergy offers significant emission reduction in CEE. 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 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 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 Romania[3]. In Russia, for example, it would be possible to enhance the sequestration by 20 MtC/yr for less than $13/tC (Zamolodchikov 2006).

Figure 2. GHG mitigation potential in EIT by economic sector, 2030.

Please note that the potential figures are not necessarily additive.

(Source: Urge-Vorsatz and Novikova 2008, with data from IPCC 2007)



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, such as health and comfort improvements, increase in social welfare and reduction of fuel poverty, employment creation and new business opportunities, higher energy security, increased value of real estate, 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. These benefits substantially enhance the value of GIS investments in certain target areas, such as domestic building efficiency, from a societal perspective.

Assessing the criteria for target area choice, in combination with the potentials in different cost categories, as well as other considerations above, the following areas have been identified by this report as potentially important GIS target areas in CEE.

While buildings house the largest cost-effective potential, many policies have been enacted in this field, especially in the EU. However, retrofitting existing buildings is difficult to achieve through policies and existing funds or carbon finance instruments such as JI could only reach an insignificant fraction of the existing building stock in the region. Therefore the **low-energy retrofit of the**

[3] Based on an assessment by the Quest JIFOR project and FAO data on available land

old, inefficient building stock has been identified by this report as a high priority target area, also associated with especially important and numerous co-benefits. Within this particular **field it is pivotal that GIS spurs investments to *very low energy* construction and retrofit**, potentially nearing passive solar standard levels[4]. The reason is that the lifetime of the building stock is one of the longest among 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 the 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 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.

4.3 Designing GIS architectures: key modalities

Table 1 summarizes the main modalities of potential GIS architectures. The main report describes each of these in detail as well as the impact of the modality choice on the effectiveness of GIS from a climate and social perspective. Here we summarise the impact of only a few selected modalities.

[4] App. 15 – 30 kWh/m2/year.

Table 1. 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 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 the first 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**	
Time frame 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 two 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

From the perspective of the management structure, the most optimal choice is if the GIS revenues do not enter any accounts of the state budget, but exist as an extra-budgetary fund, such as going directly to a National Environment Fund, which is prevailing in CEE region. This is the most optimal solution for managing risks, as the fund is separated entirely from the state budget, making it easier to trace the financial flows, and if the national budget is in a deficit, GIS funds can still be secured.

With regard to the type of greening, most buyers insist that GIS revenues are spent on climate related activities. Since governments use tax revenues for purchasing AAUs to comply with Kyoto Protocol targets, taxpayers typically expect that their money is spent on mitigating climate change. However, while some non-mitigation or non-climate related greening may be accepted by some buyers, this is likely to play an insignificant role in first generation GIS.

While behavioural measures, education and awareness raising, capacity building and training are all fundamental to reducing emissions, their role in GIS will remain limited since the resulting emission reductions cannot be monitored, easily quantified and verified. In association with this, funds for these purposes are easier to be misused than those for verified hard greening activities. Such “soft” greening activities, thus, are now expected to play a minor role in GIS schemes in all host countries, except perhaps in Ukraine. Hungary is the only country so far that does not include soft greening in its GIS.

Ensuring additionality of GIS is crucial for its environmental integrity. Even if the seller country does not require additionality in 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 that stringent additionality monitoring and 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, most GIS host countries do not have explicit rules ensuring additionality. Hungary has legislation spelling out the criteria of the three types of additionality requirements regarding JI. In GIS, it ensures additionality through the setup of its GIS scheme: it allows for investments that are additional to standard measures or those required by legislation.

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

for collecting money under different legal titles. However, emission reductions over legally mandated levels can be triggered with additional funding in the same activity if there are no specific requirements for such in the given EU-funded support scheme.

The greening ratio is presently not a strict modality. Most buyers and hosts do not specify a precise greening ratio target; however, many schemes aim to maximize this ratio. Observing the discussions above, **from an environmental perspective it is the combination of the greening ratio, the crediting period, and potential co-funding availability that determines the long-term climate effectiveness of GIS**. Following the logic above, long-term climate investments that typically have long payback times become financially feasible and bankable under GIS if either the greening ratio is low, or a longer crediting period is accepted, or there is significant co-funding – or a combination of these. If a 1:1 greening ratio is mandated with a crediting period concluding in 2012 and no co-funding is available, GIS will be able to catalise investments only into investments with very short payback times – i.e. those that are anyway implemented by the market or will be captured soon by an emerging carbon value. Fortunately the first GIS deal that might set the model for subsequent transactions allows certain reduction areas with guaranteed long-term effectiveness to be credited until 2020.

Learning from the experiences of the project-based flexible mechanisms (CDM and JI), transaction costs and challenges to baseline setting in a project-based approach may jeopardize investments into areas consisting of smaller projects – such as buildings or small-scale biomass. Therefore a programme- or policy-based approach can foster high-priority target areas in CEE much more effectively. The project-based approach may also fill in certain niches.

Monitoring and verification are crucial to ensuring environmental additionality as well as that the investments are taking place. While there is a temptation for GIS to copy-paste baseline-setting and **M&V procedures from CDM/Track-2 JI**, similar to Track-1 JI in most GIS host countries, the report concludes that this **would have a very detrimental impact on the effectiveness of GIS in high priority target areas**. An innovative solution that both ensures environmental integrity and does not impose the level of unjustified scrutiny potentially prohibiting certain target areas is, for instance, the Hungarian approach of **using ISO standards for emission monitoring and verification**. Other measures, such as using sampling instead of universal monitoring, can also help reduce transaction costs associated with M&V, while keeping the goals of the process intact.

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 till 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.

4.4 Learning from CDM/JI

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 real estate value, new business opportunities, employment creation, and reduced energy dependence.

The study concluded that it would be detrimental for GIS to "copy-paste" CDM/JI[5] 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

[5] Track 2

reduction only, which can make EE projects for example impossible as most of the EE related projects involve multiple procedures or multiple projects.

4.5 GIS vs 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.

As discussed above, for EU Member States Track-1 JI is strongly disadvantaged because of the limitations posed by the Linking Directive, effectively eliminating 80 % of possible investment opportunities in this region. Furthermore, since most GIS host countries have been implementing 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.

JI projects are usually promoted by carbon-market actors with shorter term financial interest, while **GIS, allowing crediting periods to be extended post 2012, accommodates longer-term horizons and allows governments to place emphasis on areas where early investment is crucial for the transition to de-carbonized economy in the long-term and which require robust actions**. JI became a cumbersome and difficult mechanism, at the same time, **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, such as projects involving households, 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. Finally, for certain projects types, which need a large amount of upfront payment such as land-use projects, a GIS can be more appropriate since GIS revenues are available prior to the investments as opposed to the typical revenue stream from JI. In addition, 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.

4.6 Summary of GIS developments and architectures in CEE

Based on the review of the GIS developments in the region as well as our country case studies, 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.

Table 2 compiles a selection of 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 expected to be fed into 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.

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 additionality, however, 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.

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 section of modality missing as their approach is not based on emission reduction calculation and verification. Details of the monitoring in some countries at this stage are not clear yet.

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. 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 2. GIS architectures in the countries with GIS in progress: modality choices and estimated GIS-based AAU supply[6]

	Hungary	Latvia	Ukraine	Czech Rep.	Romania
Estimated GIS-based AAU supply 2008-2012	Up to 50 MtCO2-eq	Up to 30 MtCO2-eq	100-1200 MtCO2-eq	Up to 100 MtCO2-eq	Up to 100 MtCO2-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 the special account at Ministry of Environment and Water	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[7]	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)

[6] See Table 1 for further details

[7] 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 & negotiate with the buyers	No baseline
Verification	Small project: a) carbon efficiency calculation and desk review; b) a random check; c)after the project realization check on performance of the applicant. Large project, ISO standard is employed.	TBD	Independent entity, mostly 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; Reported by the MOEW in the format of a report according to ISO 14064 standard; An 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 is regulated at this stage	Yearly report which covers the monitoring of money, projects and results	Only monitoring of projects implementation (in some cases simplified monitoring and verification of emission reductions)
Crediting period	Till 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

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 audit; 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.

Regarding the baseline for the GIS, most of the sellers chose the sectoral baseline and expect that the simplified methodology could be employed.

Regarding the priority investment areas for greening activities, Table 3 lists the priority areas for investment as identified through the research.

Table 3. 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	HU, LV, 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 CC awareness	
	Monitoring and observation on climate system	
	Building capacity on climate related legislation and policy	LV

Table 3 demonstrates that hard greening activities dominate in the majority of GIS host countries and that most host 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 system are a typical priority. This choice fills in the gap where the CDM and JI have largely failed.

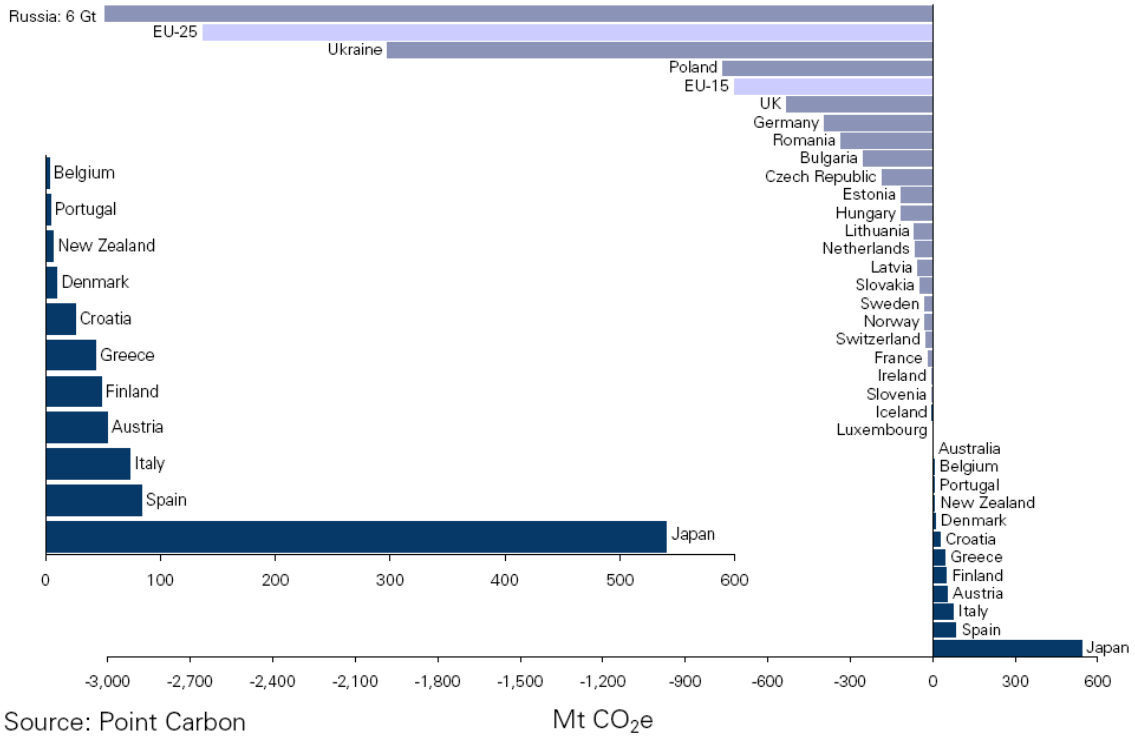
5 The role of GIS on the carbon market

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. In the outset, gross demand under the Kyoto Protocol amounts to 557 Mt/year, excluding potential demand from Canada. However, considering gross demand and supply 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.

When we take the current JI and CDM purchasing programs and other actions into account, as well as the sink provisions given in Annex Z of the Kyoto Protocol, we end up with a **remaining net demand of some 900 Mt aggregated over the five-year commitment period**[8], as illustrated in Figure 3.

[8] 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 3. 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.



One of the reasons for a relatively slow development of the GIS 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. However, the financial crisis and economic recession might provide an advantage for GIS over the other two Kyoto flexible mechanisms as it has lower project risk. The value of the AAUs expected to be transacted could be in the range of € 9 billion.

It appears likely that the GIS/AAU market will grow at a modest pace. 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, although the reality may bring a GIS dwarfed by the CDM as opposed to its potential, it is still an important market for the sellers. As noted above, the value of the AAUs expected to be transacted could be in the range of € 9 billion.

Table 4 shows estimated amounts of AAU supply through GIS by major selling countries and the potentially achievable respective GIS revenues, assuming a gAAU price of € 10.

Table 4. GIS-based AAU supply by major selling countries during first commitment period and the potential respective revenues (estimates made by Point Carbon, 2008, unless otherwise indicated)

Country	Czech Rep.	Hungary	Latvia	Poland	Romania	Russia	Ukraine
MtCO2-eq	Up to 100	50	30	Up to 100	Up to 100	0	100-1200[9]
Billion EUR	Up to 1	0.5	0.3	Up to 1	Up to 1	0	1 - 12

Since total EU investments into AAUs are likely to run in the order of magnitude of € 3.8-4.0 billion, the EU **might consider adopting guidelines on the preference towards purchasing AAUs from another member state**, all else equal. This is because if these funds are invested in other EU member states on climate mitigation, this will help the EU comply with its post 2012 CC commitments[10], avoiding significant investment needs necessary in the next commitment period.

6 Summary and recommendations

The report showed that there is likely to be a net demand of some 900 Mt greened AAUs aggregated over the five-year commitment period, with a significant oversupply of up to 6.5 Gt.

The study analysed the different modalities of GIS architectures, and their impact on GIS and 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 5 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**

[9] Estimate by The Carbon Trust

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

approaches are needed to ensure additionality. For instance, the Hungarian GIS is set up in a way that it provides funds 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 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.

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 – which is typically already taking place by JI or for 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 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 de-carbonized economy in the long-term and which require ambitious action**.

The report also conducted in-depth case studies on GIS in the building sector energy efficiency in Hungary, biomass in Bulgaria and land-use in Romania. In the areas investigated by the case studies, GIS could have a major role for realising 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 CC commitments[11]**.**

Finally, 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.

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

Table 5. 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 are 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 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 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.
Timeframe	Normally transactions will be allowed only in the 1st 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.

Modality category	Issues in modality choice and recommended modality, if applicable
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; land-use if applicable in host country.

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Contact: Contact: Jon.price@climatestrategies.org
Climate Strategies
C/O University of Cambridge
13-14 Trumpington Street,
Cambridge, CB2 1QA

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