

Working Paper

Green Investment Schemes:

First experiences and lessons learned

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AUTHORS

Andreas Tuerk, Joanneum Research, Graz, Austria
Dorian Frieden, Joanneum Research, Graz, Austria
Maria Sharmina, University of Manchester, UK
Helmut Schreiber, Joanneum Research, Graz, Austria
Diana Üрге-Vorsatz, Central European University, Budapest, Hungary



CENTER FOR CLIMATE CHANGE
AND SUSTAINABLE ENERGY POLICY



CENTRAL EUROPEAN UNIVERSITY

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Contact:

Mr. Andreas Tuerk
JOANNEUM RESEARCH
Institute of Energy Research
Elisabethstr. 5/I; 8010 Graz, Austria
Phone: 0043-(0)316-876-1337
Fax: 0043-(0)316-8769-1337
andreas.tuerk@joanneum.at

Acronyms

AAU	Assigned Amount Unit, one AAU corresponds to one tCO ₂ eq
AAUPA	AAU Purchase Agreement
CDM	Clean Development Mechanism
CEE	Central and Eastern Europe
CER	Certified Emission Reduction
CHP	Combined Heat and Power
CO ₂ eq	Carbon dioxide equivalent
COP	Conference of the parties
CP	Commitment Period
EB	Executive Board
EE	Energy efficiency
ERU	Emission reduction unit
ETS	Emission trading system
EUA	European Union Emission Allowance
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(CO ₂ eq)	Million tons (Carbon dioxide equivalent)
t(CO ₂ eq)	ton(s) (Carbon dioxide equivalent)
UNFCCC	United Nations Framework Convention on Climate Change

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Executive Summary

The former centrally planned economies – the Central and Eastern-European (CEE) countries, including Russia and Ukraine – have an estimated 8 to 12 billion surplus of governmental emissions rights (i.e. Assigned Amount Units, AAUs) for the 2008-2012 Kyoto commitment period. This AAU surplus is often referred to as “hot air”, as there is a common connotation that a major share of the corresponding emission reductions has not been reached through planned emission reduction efforts but is primarily the result of the economic downturn in energy intensive industries. Article 17 of the Kyoto Protocol (International Emissions Trading) provides for the sale of surplus AAUs to Annex-I countries that are in need of extra AAUs to comply with their emission targets. However, all potential buying countries have stated that they do not intend to achieve compliance through purchasing “hot air”. Green Investment Schemes (GIS) have been introduced to address this situation. Under GIS, revenues from sales of surplus AAUs are invested in environmental improvements in the selling nation, i.e., in “green” activities, particularly ones designed to assist in climate change mitigation. Through this mechanism, purchased AAUs become linked to greenhouse gas (GHG) emission reduction efforts. As no international rules for GIS exist, the programmes or activities in which the revenues are to be invested must first of all be acceptable to both, the selling and buying governments. Currently the continuation of AAU trading is being discussed in the context of a new climate agreement and it is unclear if and to what extent nations will be allowed to bank and use their current AAU surplus in a potential future commitment period and under what conditions.

This report assesses the shortcomings and success of GIS developments so far by reviewing GIS schemes in a number of CEE countries. It analyzes the role of GIS as Carbon finance instrument in CEE countries and the market dynamics that have evolved. Regarding the use of the GIS mechanism by CEE countries, the report shows that most AAU seller countries take advantage of GIS to focus on mitigation opportunities which are not well-suited to -- and which lie outside of the prime targets of -- Joint Implementation (JI) but are of long-term strategic importance. Improved energy efficiency in buildings provides a prime example of such opportunities.

Several issues dominate decisions on implementation and acceptance of a GIS. These include the MRV system to be used, whether or not revenues from sales will be used to supplement already existing programmes, and the amount of the reductions achieved per Euro paid. Most countries participating in GIS schemes have proposed in principle credible mechanisms to monitor and verify emission reductions and AAU revenue flows, using, for example, independent audits by recognized international auditors and existing, and well known national institutions.

As the supply of AAUs is much larger than the demand, the impact of GIS initiatives on the market will depend on purchaser requirements, particularly requirements for credibility of GIS. The report reveals that most public buyers chose seller countries carefully, buying only AAUs which will be greened in a clear and transparent way. Large AAU buyers, including private companies, however, concluded deals also in countries where there is a lack of clarity regarding important elements of a credible GIS. Such transactions, however, have led to reputational consequences for both buyer and seller. As a result, most sellers have made significant efforts to increase credibility. The report shows that the choice of a seller country often also includes factors such as an interest in strengthening economic relations to the host countries and governments and options for technology exports.

If credibility continues to be an important factor in purchases, limitations on CEE countries to design and implement credible GIS may limit the supply of salable GIS-backed AAUs. Experiences so far have shown that a number of barriers have emerged when implementing greening activities. Lack of funds to co-finance credible GIS has been a problem for CEE countries, particularly in the current economic crisis. Limited implementation capacity of host countries constitutes another barrier. Therefore, the supply of credible GIS-backed AAUs may be significantly limited in the short term. However, if credibility fails to be a critical issue for major buyers, very inexpensive non GIS-backed AAUs could be brought onto the market, depressing prices. In addition to credibility issues, AAU price development will depend on the decreasing demand for AAUs and the ongoing uncertainty regarding banking of AAUs. The Copenhagen conference increased uncertainty in the AAU market by opening the possibility that international AAU trading will end after 2012, with the consequences that AAUs will have no value after 2012. This situation has increased the pressure on CEE countries to sell as many of their AAUs as quickly as possible. The consequence may be increased temptation to sell AAUs of lower credibility and at lower prices.

While several countries have made significant progress in implementing GIS schemes, in particular there is a lack of experience with the long-term enforcement of GIS activities. Such enforcement is the responsibility not only of sellers, but also of buyers. While some buyers follow up on the implementation and enforcement of GIS activities in the seller nations, other buyers may fail to do so, possibly undermining the integrity of the mechanism. Looking ahead, experiences gained from current GIS schemes, particularly simplified approaches for MRV and additionality, may prove helpful in conjunction with the development of fund-based support mechanism for developing countries after 2012. Further, GIS has provided insight into how to tackle a range of reduction opportunities not easily addressed through either JI or the CDM. The experiences also have highlighted the critical role of institutional capacity and the role of purchaser integrity and responsibility in ex-ante funding of GHG reduction initiatives. In case the AAU market continues to be a part of future international agreements, proper integration of these lessons can contribute to the carbon market strength.

1 Introduction

1.1 The concept of GIS

The former centrally planned economies, i.e., the Central and Eastern-European (CEE) countries, including Russia and Ukraine have a surplus of governmental emission rights (Assigned Amount Units, AAUs¹) of between 8 and 12 billion during the first commitment period of the Kyoto Protocol, running from 2008 to 2012 (Société Générale 2009, Point Carbon 2009a). This AAU surplus is often referred to as “hot air”, as there is a common connotation that a major share of the corresponding emission reductions has not been reached through planned emission reduction efforts but is the result of the economic downturn during the 1990s, leading to the closing of energy intensive industries.

In principle, AAUs can be sold under Article 17 of the Kyoto Protocol to Annex-I countries that are not able to comply with their targets through domestic efforts, i.e. which have a gap in meeting their Kyoto targets. Countries with such a shortfall of emission rights include Japan and some of the EU15 member states. In Japan also companies can purchase AAUs to meet their voluntary domestic targets, whereas in other nations the use of AAUs is limited to governments. All of the potential buyer countries have 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 related to specific emission reduction activities (Gorina, 2006). The basic principle of Green Investment Schemes is to invest the revenues from surplus AAU sales into “greening” activities in a manner that is acceptable for both, the selling and buying governments.

There are two types of “greening” depending on the nature of the greening activities. *Hard greening* refers to activities in which the greening process directly delivers measurable and quantifiable emission reductions. If the corresponding activities have non-quantifiable and non-measurable emission reductions, this is called *soft greening* (Blyth and Baron, 2003; Andrei *et al.*, 2006). Typical hard greening activities include investments in emission reduction technologies, e.g. in projects in the fields of renewable energy and the retrofitting of buildings. Soft greening includes environmental education and capacity building related to climate change; demand-side management programmes, technology development, capitalization of energy service companies, insurance funds for energy efficiency investors or dismantling of energy subsidies (Tangen *et al.*, 2002; Blyth and Baron, 2003; Andrei *et al.*, 2006).

In addition to the greening types, a term often used is the so called “greening ratio”. The greening ratio describes the relation between the amount of AAUs sold to the emission

¹ According to the Kyoto Protocol each AAU gives the right to emit one ton of CO₂ equivalents (tCO₂eq)

reductions achieved. The greening ratio depends largely on the period over which emission reductions are measured or calculated.

1.2 Aims of this working paper

The continuation of AAU trading is currently discussed in the negotiations for a new global climate agreement. Some countries, such as the United States, oppose the continuation of AAU trading as a part of a wider opposition against a new multilateral top-down climate architecture. Furthermore, even in case of striking a Kyoto-type agreement it is unclear whether and to what extent the large surplus of AAUs from the current commitment period can be banked or used in the next commitment period and under what conditions.

As since two years several CEE countries are in the process of implementing GIS schemes and more than 20 deals have been reported so far, this paper provides insights into different planned or implemented GIS schemes, the role of GIS as carbon finance instrument in CEE countries and discusses the market dynamics that have evolved. The paper also attempts to assess whether GIS can be seen as a success so far and briefly analyses to what extent GIS could serve as a model for new fund based mechanisms in developing countries. The paper builds upon and updates the study “Green Investment Schemes: Maximizing benefits for Climate and Society” carried out under the Climate Strategies network² (Ürge-Vorsatz *et al.*, 2008).

² <http://www.climatestrategies.org/our-reports/category/36.html>

2 Overview and analysis of Green Investment Schemes in CEE countries

This chapter gives an overview of planned and implemented GIS schemes in CEE countries based on interviews with country representatives and relevant documentation³.

2.1 Czech Republic

GIS development

The Czech Republic has a 8% reduction target under the Kyoto Protocol, with the base year 1990 (UNFCCC 1997). The country has a total of 831 million AAUs, out of which 754 million are reserved for the commitment period reserve (UNFCCC, 2010). The current surplus is estimated to be around 150 million AAUs and the government is planning to allocate about 100 million AAUs to GIS (Fiala, 2010). The first transaction took place in March 2009, when 40 million AAUs were sold to Japan's New Energy and Industrial Technology Development Organization (NEDO). Three deals followed in September and October 2009 when the Czech Republic sold AAUs to the Japanese company Mitsui (20 million), and the Austrian (3.5 million) and Spanish (5 million) governments (Fiala, 2010). The country has sold additional 2.5 million AAUs to Mitsui in March 2010 (Point Carbon, 2010b). In total this sums up to 71 million AAUs sold.

Managing AAU sales and revenues

The Ministry of Environment (MoE) coordinates the GIS management and negotiates with AAU buyers. The State Environmental Fund (SEF) takes decisions regarding the allocation of funds and carries out the project control management. Representatives of the SEF, the Parliament, and the Ministry of the Environment form the Programme Managing Authority which deals with applications for GIS subsidies and is responsible for the reporting process. AAU revenues are transferred to a special account at the MoE, not entering the state budget. Another important element of the GIS management structure are five large banks that have numerous of branches in the Czech Republic. They are involved in the scheme for administrative purposes and, possibly, for providing co-funding (Personal communication 1, 2009). The revenues of the AAUs sales have to be spent by 2012 (Valentova, 2009).

Monitoring and verification

In addition to the Programme Managing Authority that meets approximately every two weeks, there is a Monitoring Committee consisting of representatives of involved Ministries, the SEF, the Parliament, the Senate, and NGO-representatives who meet quarterly. The Monitoring

³ This report includes Russia and Ukraine in the definition of "CEE countries"

Committee is responsible for supervising the efficiency of the implementation of the GIS. Furthermore, an international auditor monitors financial flows as agreed with the buyer. Also the verification of emissions reductions will be carried out by international auditors.⁴ At least 5% of the projects will be checked on-site. If a project is not implemented correctly, the money will be partly or fully recalled from an applicant (Personal communication 1, 2009; Valentova, 2009).

Priority areas for GIS investment

The Czech Republic's priority area for GIS is the buildings sector. GIS investments in other sectors are still restricted since various support programmes already exist, potentially raising additionality questions. While the AAU revenues have to be invested in pre-defined programmes (up to now in the Green Savings programme), the buyer's position regarding financial disbursement is taken into account through agreement on eligibility criteria for projects. The Czech GIS provides for both, soft and hard greening. Five per cent of the AAU revenues are used for administrative purposes, 95% for the projects and programmes themselves. The list of selected projects under this programme will be included in the budget report for the buyers. The Czech GIS is providing for a programmatic approach but simplified compared to CDM/JI, based on experiences with projects in the residential sector.

Project details

On April 22, 2009, the so called Green Savings programme was opened to applicants and will run until mid 2012. Beneficiaries include owners of family houses and apartment buildings, i.e., natural persons, associations of owners, housing cooperatives, municipalities and business entities. The amount of emission reductions must be proven within the projects lifetime of 15 years. The programme is divided in three areas: energy savings in space heating (insulation), construction in the passive energy standard and the use of renewable energy sources for heating and hot water supply (Valentova, 2009). Among residential houses, non-panel blocks can be unconditionally supported by the scheme. Regarding panel buildings, the precondition for support is that households applying for GIS funds cannot simultaneously participate in the national panel-buildings support program. The latter provides soft loans from the Ministry of Regional Development (unlike GIS that provides subsidies). Beneficiaries can apply for the funding upfront, however the money flows after the implementation of the projects or shortly before they are finalized. Projects must be completed within 18 months and have to be finalized before the scheme is closed.

Theoretically, 100% of the investment costs can be covered by GIS funds. However, it is planned that on average about 30-50% of the investment costs will be financed by AAU revenues. The scheme provides that a household will receive a fixed amount per m² if a 20% reduction of the annual energy needs for space heating is achieved. An increase of the support

⁴ The auditing firm Deloitte Advisory s.r.o. will audit the investments; verification will be done by Det Norske Veritas and the Energy Efficiency Center SEVEN (Fiala, 2010).

is provided for a 30% reduction and an even higher support if a 40% reduction is achieved subject to a limitation of the annual energy need for space heating to 70 kWh/m².⁵

As of November 2009, more than 1800 applications have been submitted to the Programme Managing Authority with 96 % requesting support for single family houses. The total value of the processed applications amount to around 9.8 million Euro, around 10% of the funds of approx. 960 million Euro raised through AAU sales by October 2009 (Valentova, 2009). As a sub-programme of the Green Savings program, an information campaign will be launched in spring 2010 with the purpose of promoting energy efficient appliances (Valentova, 2009).

2.2 Latvia

GIS development

Latvia has a 8% reduction target under the Kyoto Protocol, with 1990 as base year (UNFCCC, 1997). The country has a total of 119 million AAUs, out of which 53 million are used for the commitment period reserve (UNFCCC, 2007a). The Latvian government allocated around 40 million AAUs for a GIS, out of which 18.5 million AAUs have already been sold to Austria, the Netherlands, Spain, Japan, Portugal and a Japanese private buyer. Money from the sale of AAUs is transferred to an income budgetary account in the State Treasury. Disbursements are organized under the budget programme “Climate Change Financial Instrument” which is the official name of the GIS in Latvia (Personal communication 3, 2009). The Ministry of Environment is the major institution to coordinate the GIS and manage GIS funds. In 2007, Latvia adopted a law on the Kyoto Protocol mechanisms, which proposed a GIS as a tool for managing AAU revenues. The statutes of the Advisory Council of the Climate Change Financial Instrument were approved on April 28, 2008, and amended on March 17, 2009. The latest amendment added more details on how representatives from NGOs are selected into the Advisory Council in order to ensure a more transparent scheme. According to the statutes, the Advisory Council consists of representatives of the Ministry of the Environment, of other ministries, AAU buyers and NGO-representatives. Two persons are selected from environmental NGOs and two from NGOs related to the sectors targeted by the GIS (Personal communication 3, 2009). The first meeting of the Advisory Council took place on August 28, 2009.

Monitoring and verification

There are two financial reports for buyers: a tender report – after the tender is finalized, and a progress report – including information on the spending of the funds and project implementation details. In addition, international auditing by a recognized auditor is carried out. The auditor, who is responsible for verifying both disbursement of funds and greening is financed from GIS revenues. Internal audits by the Internal Audit Department take place

⁵ Note: First, the scheme provided both, a fixed amount and a percentage of investment costs, but later the percentage element was abandoned

quarterly. Furthermore, the aforementioned Advisory Council has the task to ensure transparency for the public.

Greening types and priority areas for investment

Earlier, it was stated by the government that the country would allow both, hard greening and soft greening, with the latter to balance the reported lack of hard greening opportunities in the country. However, currently only hard greening projects are supported in Latvia and all AAU revenues are invested into CO₂-reducing projects. Buyers of AAUs are said to be satisfied with the applied definition of “hardness” (Personal communication 3, 2009). Legal, financial and technological additionality are a prerequisite for project selection. An overlap with EU structural funds has to be avoided. Therefore energy efficiency measures are restricted to measures in buildings (Bisters, 2010). The priorities for investment are energy supply- and demand-side management and include the following areas as well as integrated projects (Bisters, 2010):

- Promotion of biomass use including CHP plants;
- Biogas recovery and use, including transport;
- Solar heat, geothermal and small hydro;
- Improved thermal energy efficiency;
- Improved use of electricity;
- Technological processes and product design.

Project details

The first of several planned tenders was announced on July 28, 2009, and called for “energy efficiency in municipality buildings”. It was completed in 2010, and contracts for a total volume of 37 million Euro were signed with beneficiaries (Bisters, 2010). There were certain baselines/thresholds as precondition for the projects to be eligible for the tender:

- the planned energy consumption reduction had to be no less than 25% of the average energy consumption in 2006, 2007, 2008;
- the volume of a project had to be no less than 50,000 LAT (ca 70,000 Euro⁶) and should not exceed 2 million LAT (ca 2.8 million Euro);
- public procurement had to be a mandatory part of a project; related spendings had to be greater than or equal to 1,000 LAT (ca 1,400 Euro).

The measurement of CO₂ reductions is a responsibility of the beneficiaries and is based on measuring energy consumption reductions. These are translated into carbon dioxide reductions through emission factors taking into account the fuel mix. The approach is similar for all tenders, but the requirements will be included into every single tender’s description. The first tender provided for a programmatic approach, i.e., municipalities applying for GIS grants could pool a large number of buildings into one project. Various energy efficiency measures could be combined as well.

⁶ 1 LAT equals around 1.4 €(as of April 2010)

The Latvian GIS does not build on any other national support scheme, but is an independent scheme, avoiding possible conflicts between schemes. Beneficiaries have to co-finance the projects, however, for the first tender, a high intensity of support was envisaged to attract participants and to account for the country's tough financial situation (85% of the selected project costs are covered by the AAU funds). If the greening activity is not implemented in line with the GIS contract, the beneficiary is obliged to provide a self-financed action plan to achieve the intended CO₂ emission reductions. In cases where greening is not possible to be ensured the AAU funds will be recalled and reinvested by the government (e.g., bankruptcy of the beneficiary).

2.3 Hungary

GIS development

Hungary has a 6% reduction target under the Kyoto Protocol, with the average of 1985-87 as baseline emission level (UNFCCC, 1997). The country has a total of 578 million AAUs, out of which 420 millions are used for the commitment period reserve (UNFCCC, 2006a). Hungary was one of the “early movers” regarding the setup of a GIS and has been the first country that concluded an AAU deal under a GIS. However it suffered reputational problems due to unclarity of revenue spending and additionality concerns. The government initially had planned to sell 45-55 million AAUs, of which 15 million AAUs would have been earmarked for the pilot phase and 30-40 million for the 2nd phase of the scheme (Feiler, 2008). Two transactions took place in autumn 2008 when 6 million and 2 million AAUs were sold to Belgium and Spain, respectively. In November 2009 a third deal on estimated 3 million AAUs with a Japanese company was reported (Point Carbon, 2009c).

The proceeds had not been disbursed for a longer period, and the scheme described below had been stalled due to a poor financial performance of the country during the 2009 financial crisis (Personal communication 2, 2009). According to media reports, the Hungarian government had tried to use GIS revenues to deal with its financial problems (Point Carbon, 2009c; Point Carbon, 2009k). The Belgian Prime Minister, Herman van Rompuy, wrote a formal letter of complaint to Hungary's Prime Minister at that time, Ferenc Gyurcsany, on this matter (Point Carbon, 2009k). Therefore, other potential purchase agreements, for example with Japan, were postponed or not concluded (Point Carbon, 2009k). However, the first disbursements have now been made under the two GIS programmes implemented in 2009 as described below. In the meanwhile, Spain has expressed its satisfaction with the Hungarian GIS (Point Carbon, 2009j). Currently, there is reason to believe that the Hungarian government is trying to sell more than 55 million AAUs.

Management structure and budgetary option for the AAU sales revenue

The Minister of Environment and Water is primarily responsible for the management of the AAU surplus and decides on the sale of AAUs (with the agreement of the Minister of Finance).

The revenues from the sales of AAUs enter a special account at the Ministry of Environment and Water (MoEW) and do not stay in the state budget (Personal communication 2, 2009).

Principles for GIS design

For administrative purposes no more than 5% of the GIS revenues can be used as stated in governmental decrees.⁷ According to these decrees, the activities have to satisfy requirements in terms of environmental additionality, financial additionality and legal additionality. Environmental additionality means in this context that GIS activities should result in net CO₂eq emission reductions. Financial and legal additionality provisions provide that the projects cannot be realized without GIS support and are not prescribed by any act or legal instrument in force. Soft greening is excluded from the greening options. This decision grants Hungary a better position when negotiating with the buyers on the price of AAUs (Personal communication 4, 2009). GIS funding in Hungary can be carried out as a grant, an interest rate subsidy, refundable aid, *de minimis* aid or environmental protection aid (Government of Hungary, 2010). The Hungarian GIS allows for GIS support also in areas where other state or EU funding is available, but in all cases there is a need for producing additional emission reductions over what is achieved by other financial support. Combining various sources of support is intended to strengthen the scheme and to reduce transaction costs. However, there is an ongoing concern that GIS funds in Hungary may be used to finance programmes for which the state support has been reduced and thus compensate budgetary problems.

Monitoring and verification

Reports on the implemented GIS projects and programmes include a monthly as well as an annual audit report prepared by the Development Directorate of the MoEW. The Development Directorate involves an international auditor for the annual reports. The annual report which includes the realized emission reductions will be made public.

Priority areas

Hungary has indicated that the GIS will be implemented in areas that were not attractive for JI projects (Feiler, 2008). The priorities for GIS investments in Hungary are (Government of Hungary, 2010):

- increasing the energy efficiency of buildings,
- increasing the use of renewable energy,
- increasing the effectiveness of district heating systems,
- promoting the construction of low energy use buildings,
- modernisation of lighting and public lighting systems to increase energy efficiency,
- promoting the establishment of carbon sinks,
- realization of emission reductions in the transport sector,
- replacing inefficient household appliances with environmental friendly ones.

⁷ Governmental Decree 323/2007 (XII.11), and the Governmental Decrees 121/2009 (VI.11.) and 280/2009 (XII.11.)

Energy efficiency in the building sector is the main priority for spending AAU revenues in Hungary given that around 30 % of the total Hungarian emissions are related to buildings (Government of Hungary, 2010).

In 2009 two GIS programmes in the building sector were launched: the *GIS Climate Friendly Home Panel Sub-programme* and the *GIS Climate Friendly Home Energy Efficiency Sub-programme*, supporting energy efficiency and the use of renewable energy sources in buildings. For both programmes, the support consists of a basic grant and optionally of a „Climate Bonus”, depending on the energy category reached. For the Climate Friendly Home Energy Efficiency Sub-programme a maximum support of 60% of the investment costs can be obtained if the applicant targets and realizes an upgrade of the building to energy category A+.

The application period for the Panel Sub-programme was closed on 31 December 2009, whereas the Energy Efficiency Sub-programme was launched at the same time. For the Panel Sub-programme, more than 1,500 applications were submitted by owners of condominiums, housing associations and municipalities, each application covering a number of flats. The evaluation of the applications has not yet been finalized but is in progress (Government of Hungary, 2010).

The development of further GIS programmes is in process. These target, among others, energy efficiency in public transport, lighting, and household appliances. Depending on the access to additional sources of support, programmes for the use of renewable energy by public institutions, SMEs, district heating suppliers and others will be developed (Government of Hungary, 2010).

2.4 Poland

GIS development

Poland has a 6% emission reduction target under the Kyoto Protocol, with 1988 as base year (UNFCCC, 1997). The surplus AAUs total 500 million tCO₂eq (Polish Ministry of the Environment, 2009), which is a 200 Mt downgrade from previous estimates (Budzanowski, 2008). The government of Poland hoped to sell 50 to 100 million AAUs before 2010 (Point Carbon, 2009b). So far two deals with Spain and a private Japanese investor amounting to around 55 million Euro have been reported. In principle the government would sell the total surplus, however it sees the “combination of the situation on the international market (the needs, the demand, and AAU prices), buyers' preferences and requirements on the completion date of GIS programmes” as the limiting factors (Personal communication 16, 2010).

Managing AAU sales and revenues

The Act on the “System for Managing the Emissions of Greenhouse Gases and Other Substances” lays the foundation the management of CERs, ERUs, and AAUs and was enforced on March 31, 2009 (Polish Ministry of the Environment, 2009). The possibility to sell AAUs had been established by a bill passed by the parliament in July 2009 and later signed by the president. The main institutions related to the GIS and AAU revenue management comprise the Ministry of Environment, the National Administrator of the EU Emission Trading Scheme (KASHUE), the National Fund for Environmental Protection and Water Management, and the EcoFund (Polish Ministry of the Environment, 2009). It is envisaged to accumulate the AAU revenues in a special Climate Account at the National Fund for Environmental Protection and Water Management. The latter is also responsible for verifying beneficiaries' semi-annual reports on GHG emissions reductions and AAU money disbursement as well as for reporting yearly to the Ministry of Environment. A council will be set up as an advisory board consisting of representatives of ministries and of the National Centre for Emissions Balancing and Management (Polish Ministry of the Environment, 2009).

Priority areas

The priority areas for GIS investments are energy efficiency in buildings and in other sectors of the economy, clean coal technologies, fuel switch, research and development, capacity building on climate change and industrial processes (Polish Ministry of the Environment, 2009).

The envisaged programmes include (Zborowska, 2010):

- Energy efficiency in public buildings;
- Energy efficiency in district heating and co-generation;
- Biomass-fired power plants;

- Agricultural biogas plants;
- Upgrading the electricity grid for connecting renewable wind energy sources.

As in most other CEE countries, both, project-based and programmatic approaches are considered in Poland.

2.5 Estonia

GIS development and institutional setup

Estonia has a 8% reduction target under the Kyoto Protocol, with 1990 as base year (UNFCCC, 1997). The country has a total of 196 million AAUs, out of which 107 million are used for the commitment period reserve (UNFCCC, 2007g). The surplus AAUs total 85 million. GIS activities defined by the government cover the revenues from sales of all 85 million AAUs, often including concrete pre-defined projects (Personal Communication 5, 2010). The GIS is led by the Prime Minister's office (State Chancellery). The Estonian Ministry of the Environment carries out the negotiations and signs the AAUPAs. The State Chancellery coordinates an inter-ministerial working group that is responsible for developing the GIS programmes and projects. For the sales of AAUs, a government regulation is issued to approve each AAUPA and set its contents into law. The use of AAU revenues exclusively for the GIS is required by the State Budget Act and the government regulation for approving AAUPAs. In April 2010 a first deal with Austria over 1.4 million AAUs was reported (Point Carbon, 2010d)

Management of GIS funds and funding schemes

A separate account is opened in the Treasury for each GIS programme. The use of money from this account is regulated by §19 of the State Budget Act, i.e., this money can be used only for GIS activities. A statement of account can be ordered by the AAU buyer at any time. Detailed greening plans will be part of the AAUPAs (Personal Communication 5, 2010) and are developed for each AAU purchaser individually.

AAU proceeds may be used to expand existing EU structural funds programmes⁸, as the demand for financial support for environmental protection projects exceeds what is currently available from EU sources or from the state budget. For the expansion of existing measures the use of revenues from AAU sales will be subjected to the same provisions of monitoring, surveillance and reporting as required by the EU for the use of structural funds. The "Structural Assistance Act" and the accompanying decrees regulate the use of revenues from AAU sales if channelled into the existing EU structural funds measures (Government of Estonia, 2010). Additionality assessment is an integral part of developing GIS projects and programmes. Estonia has included a provision to guarantee financial additionality in its scheme. Thus

⁸ The Structural Funds and the Cohesion Fund are the financial instruments of European Union (EU) regional policy, which is intended to narrow the development disparities among regions and Member States. The Funds participate fully, therefore, in pursuing the goal of economic, social and territorial cohesion.

programmes and projects will only receive GIS status if this GIS funding is essential to achieve implementation. Not only projects are allowed under the Estonian GIS, but also a programmatic approach is supported, with the applicants being able to join the scheme any time within the first commitment period.

Monitoring, Reporting and Verification

The institutional setup and methodology for monitoring and verification will be programme- as well as client-specific and involves existing, well established, institutions, such as the Environmental Investment Center. The Ministry of Environment on behalf of the implementing agency will be responsible for reporting to the GIS purchaser. The reporting will include semi-annual reports, annual reports, a final report after the end of the monitoring period and possible post-implementation-period reports. The annual and final reports will typically include the following information:

- a description of the projects and measures implemented under the greening plan,
- total costs of the implemented project measures and the volume of the proceeds received,
- the proceeds spent for each project and the amount of any unused and misused proceeds at the end of each reporting period; in the case of misused proceeds also the reason why the money has not been used,
- the expected and achieved GHG emission reductions following the methodology defined in the greening plan.

Financial and greening audits of the annual and final reports are undertaken by internationally recognized auditors. Estonia will authorize the auditor to have full access to all data, information, documents and invoices that are relevant to the disbursement of the GIS proceeds.

Priority areas for investment

AAU revenues are used exclusively for hard greening projects. Buyers can choose their preferred greening programmes/projects. Priority areas include energy efficiency in residential and public sector buildings, the improvement of district heating networks, boiler-house rehabilitation, expansion of renewable electricity use, industrial energy efficiency, and public transport projects. A detailed catalogue of planned projects and programmes has been developed by the government. This catalogue includes the corresponding amount of AAUs to be sold in order to finance each programme/project type, as well as the expected greening ratio for each project type. The following table shows the project types envisaged under the Estonian GIS. It has to be noted that the “greening factor” (i.e., greening ratio) only represents the cost per tone of reduction stipulated by the purchaser. To achieve this ratio, it may be necessary to complement the GIS funds with funds from other sources. The intensity of support by GIS revenues is between 20 and 100 percent in Estonia, depending on the programme. In most cases the disbursement of GIS funds is required before 2012, later disbursements are the exception.

Table 1: Envisaged programme/project types under GIS in Estonia

(Government of Estonia, 2010)

GIS programme/project	AAU volume (Mt)	Estimated greening factor
Energy efficiency and use of renewable energy at small boiler houses, improvement of district heating networks	5,0	0,5
Energy efficiency in apartment buildings	7,1	0,1-0,5
Energy efficiency in public buildings	≥5,0	0,1-0,5
Increased share of renewable electricity	20,8	0,5-1,0
Reduction of electricity consumption through technology investments	2,8	≥1,0
Promotion of sustainable bus transport at county lines	2,2	0,1-0,5
Promotion of railway transport	10,2	≤0,1
Balancing station for increased use of renewable electricity (hydro-pump / gas turbine)	16,7/13,3	1,0-2,0
Strengthening of power grids at coastal areas for increased use of renewable energy	5,0	≥2,0

Additional projects and programmes are under development including energy efficiency improvements in private houses, construction of energy efficient settlements, and the promotion of the use of electric cars. Estonia is also open to discuss other areas for channelling GIS investments, those where the purchasing country's companies have an interest to supply technology.

2.6 Romania

Romania has a 8% reduction target under Kyoto Protocol, with 1989 as base year (UNFCCC, 1997). The nation's total AAU amount is 1.3 billion tCO₂eq, with a commitment period reserve of 0.78 billion tCO₂eq (UNFCCC, 2008a). According to recent media reports, Romania aims to sell 200 million AAUs and could start selling AAUs during 2010 (ICIS Heren, 2010).

In Romania, the discussion on GIS has been going on for more than six years. In 2006, the report "Developing a Green Investment Scheme in Romania" (Andrei *et al.*, 2006) proposed a general design for GIS in Romania, including the basic management structure and priority areas. However, the final decision on GIS by the government of Romania was delayed for several years. Moreover, the scheme developed by the end of 2008 has been discarded due to various reasons including the lack of an appropriate legal framework. The necessary regulations are now planned to be brought into place until mid 2010 (ICIS Heren, 2010). A detailed description of the Romanian scheme that has been discarded by the government can be found in Ürge-Vorsatz *et al.* (2008).

2.7 Bulgaria

GIS development

Bulgaria has an emission reduction target of 8% under Kyoto Protocol, with the base year 1988 (UNFCCC, 1997). The nation's total AAU amount is 610 million tCO₂eq, with a commitment period reserve of 353 million tCO₂eq (UNFCCC, 2008a). The AAU surplus in Bulgaria is expected to be up to 200 million (Government of Bulgaria, 2010). The Bulgarian government intends to sell as much as possible of its AAU surplus (Personal communication 13, 2010).

Bulgaria started working on a GIS back in 2005, far earlier than most of the other countries in the region. With funding and technical assistance from the World Bank, a report titled "Options for Designing a Green Investment Scheme for Bulgaria" was developed (World Bank, 2005). The report was among the first country specific GIS studies. However, since 2005 no further development has occurred. 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. One of the main reasons for Bulgaria to start reconsidering the implementation of a GIS is the difficulties the country has with JI for which GIS would be an alternative. Governmental elections in July 2009 created new uncertainties regarding the implementation of a GIS. However, the new government shows interest in developing a GIS. A draft GIS legislation has been recently developed but still needs approval by the National Parliament (Government of Bulgaria, 2010).

Managing AAU sales and revenues

The draft GIS scheme provides that all proceeds from the sale of AAUs will be utilized for activities decreasing greenhouse gas emissions within the territory of the state, or resulting in other positive ecological effects in accordance with the requirements of the European and national legislation in the field of environmental protection. AAUPAs signed between the National Trust EcoFund (NTEF) and the project investors will include criteria for project eligibility and requirements for project funding. Negotiations are conducted by the Minister of Finance, the Minister of Environment and Water, and the Minister of Economy, Energy and Tourism. AAU proceeds enter a special off-budget account which is maintained and controlled by the Minister of Finance. The Minister of Finance controls the execution of the contracts for sale of AAUs and the utilization of the funds, granted by the NTEF via the project contracts, signed between the NTEF and the project investor. Project funds are transferred in tranches in accordance to the implementation timeframe specified in the contracts. Up to 5% of the funds are transferred to the NTEF to cover the administrative expenses related to the management of the GIS (Government of Bulgaria, 2010).

Monitoring and verification

Controlling and monitoring of the execution of contracts and the implementation of projects is carried out by the Executive Board of the NTEF. This refers e.g. to the procurement, evaluation, validation, and financing of projects. The verification of the implementation and achieved results of the projects is done by accredited independent organizations, including organizations accredited by the UNFCCC. Project executors and the NTEF bodies have to enable access to the data required by the accredited organizations. In order to ensure the correct use of funds, representatives from the AAU buyer-states can participate in the activities of the Advisory Committee of the NTEF. The criteria and decisions for approval as well as the projects evaluation and implementation reports will be publicly available (Government of Bulgaria, 2010).

Priority areas for GIS investment

The funds generated from the sale of AAUs are used for financing projects in the sectors energy, transport, agriculture and forestry, waste management, water management, and industry. According to the draft GIS scheme possible project types include (Government of Bulgaria, 2010):

- Increasing energy efficiency and use of renewable energy sources (RES) (specifically biomass utilization), e.g., through development and deployment of eco-friendly technologies;
- Capture and utilization of methane;
- Afforestation, reforestation and other land use change;
- Educational measures, scientific research, measures for administrative capacity building and management of Climate change policies;
- Awareness raising of the public and society on issues related to Climate Change;
- Development and implementation of measures for adaptation to climate change.

In addition to GHG reductions, the projects should significantly improve the quality of the environment, including reductions in air, water and soil pollution.

2.8 Lithuania

Lithuania has a emission reduction target of 8% under the Kyoto Protocol, with 1990 as base year (UNFCCC 1997). The total amount of AAUs is 227 million tCO₂eq, with 109 million tCO₂eq reserved for the commitment period (UNFCCC, 2007e). Although Lithuania has not yet approved a national AAU management strategy, the possible allocation of funds to GIS could total about 50 million tCO₂eq, this is the countries total surplus (Personal communication 11, 2009).

In April 2010 the Lithuania government has adopted a GIS legislation, details of the planned GIS have not been published yet. Possibly the Ministry of Environment will be in charge of the GIS and the Environmental Investment Fund the manager of the revenues The priority areas for GIS are energy efficiency and renewable energy sources in public and residential buildings with transport, industry and agriculture as potential options for the future. The specification of MRV provisions will be part of the AAU purchase agreements and will most likely involve third parties. Several types of support are under consideration, including grants and soft loans (Personal communication 11, 2009). The government has been in talks with 11 potential buyers that are keen on buying Lithuania's surplus (Point Carbon, 2010c)

2.9 Ukraine

GIS development

Ukraine holds an amount of 4,164 million AAUs for the first Kyoto commitment period. The commitment period reserve is 2,067 Mt (UNFCCC, 2006b). As the national reserve is 1,400 Mt, the amount that may be sold under a GIS in the first commitment period is around 1,000 million AAUs (National Environmental Investment Agency, 2009; see also Filonenko, 2008). It is unclear at the moment how much Ukraine plans to sell; in the past an indicative target of about 400 million was mentioned. Spring 2009 saw 44 million AAUs being sold to the Japan's government and to a Japanese company (Point Carbon, 2009a). In December 2009, 3 million AAUs were sold to Spain (Point Carbon, 2009k). Additional 450 million units were under negotiations to be transferred to companies in Switzerland, New Zealand and Japan (Point Carbon, 2009a) but have not been reported as being sold so far. Furthermore, the country has signed MoUs with Italy and the Worldbank (Point Carbon, 2009a) and is currently discussing additional sales with the EBRD and the EIB.

Despite its potentially high amount of AAUs Ukraine can sell, only very few projects have been identified so far, that are suitable for AAU finance, not yet enough to fulfill the country's obligations under the signed contracts with Japan and Spain. Given these experiences it cannot be expected that Ukraine will sell a large amount in the short term, a few medium-size deals are still possible (Personal communication 19, 2010).

Managing AAU sales and revenues

In March 2008 a governmental decree regulating GIS in Ukraine (Decree No. 221)⁹ was adopted. According to this decree 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. With regard to GIS, NEIA is responsible for negotiations with buyers as well as for the design of the GIS under the government's supervision (Decree No. 221, 2008; Filonenko, 2008; Personal communication 8, 2009). A specific GIS law embedded in the country's legal system was so far not seen as necessary; the AAU sales and revenue disbursement processes operate through governmental decisions. Each of Ukraine's AAUPAs provides that the disbursement of funds is due prior to 2012, provides for an annual reporting and periodic site-visits and regulates details on international technical and financial inspection.

There is no overall GIS architecture in Ukraine. The current domestic legislation (Law on State Budget) however includes a clause that provides for the use of GIS funds only for projects directly leading to emission reductions. Specific details of greening activities and greening

⁹ 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"

requirements are reached in bilateral consultations on each GIS project between Ukraine and the buyer country and are included in the AAUPA. It is not yet clear in what form the AAU revenues will finance the projects. It will most likely be a mixture of financing options such as grants and soft loans depending on the project. Furthermore, it is not yet fully defined what share of the revenues will be channelled through which option. The government is open to many options depending on the project needs (Personal communication 8, 2009). As a partner of the NEIA, the Ukraine Exim Bank (UEB) is playing an important role in managing AAU revenues. The UEB has considerable experience in managing JI projects and plans to extend its services to GIS. The UEB is currently in discussions with the EBRD to link an energy efficiency loan of 100 million to a GIS project. Similar discussions take place with the EIB and the World Bank.

Monitoring and verification

Details about MRV are included in the contracts with the buyers, which are not publicly available. Buyers will be able to send their representative(s) to participate in the MRV process. In addition, project performance reports will undergo checks by an independent accredited verifier, but the current Ukrainian GIS regulations do not state that Ukraine is obliged to provide this information to a buying country (Personal communication 15, 2009).

Priority areas, greening types and beneficiaries

In 2008, the government informally stated that its priority areas for GIS investments are energy efficiency, district heating, and forest management. In 2009, the priority areas, basically, remained the same, but the scheme became more buyer-tailored, i.e., the choice of projects now strongly depends on the buyers' preferences. A list of projects to be financed through AAU sales was under preparation in 2009 in cooperation with buyers. Projects that do not directly lead to CO₂ reductions were allowed under a soft-greening option. The latter, however, conflicts with the claims that projects implemented in 2009 were intended to include only hard greening, with soft greening to be allowed from 2010 onwards (Personal communication 15, 2009). The projects that are currently on the list will not target individuals. However, the NEIA claims that any environment-friendly projects will eventually have a positive effect on people and the society.

2.10 Russia

Russia's Kyoto target is to maintain its 1990 emissions level (UNFCCC, 1997). The nation has a total AAU amount of 16.6 billion tCO₂eq, with a commitment period reserve of 10.6 billion tons (UNFCCC, 2008b). The country is planning to reserve 10%, around 1-1.6 billion tons for JI projects. It is not likely that Russia will sell more than 200 million AAUs within the first commitment period (Personal communication 6, 2009). The Russian government has repeatedly indicated that it does not intend to flood the market with AAUs, as this may lead to a strong reduction of the price.

Russia initiated the idea of GIS back in 2000. However, ten years have passed, and the development of the Russian GIS is still stagnant, although legally important decisions have been taken recently: on October 28, 2009, the Russian government adopted Directive 843, dealing with JI issues. According to this directive, the Ministry of Economic Development will be the focal point for JI activities, while the state owned Sberbank will be the "operator of carbon units". With regard to GIS, Sberbank will be the key institution to prepare deals. Sberbank is currently in discussions with possible buyers, including Italy and Spain. There are several reasons why Russia has been slow in developing a GIS. One of them is that the government is interested in extending the GIS into a post-2012 regime. The other reason is that revenues from AAU sales are not of high priority for the country, compared to other far more lucrative business areas, such as oil and gas exports (Personal communication 7, 2008; Personal communication 6, 2009).

2.11 Slovakia

Slovakia has Kyoto base year emissions of 73 Mt and a reduction target of 8%. Therefore the Kyoto target is to emit not more than 67 Mt CO₂e, or 335 Mt CO₂e over the five years from 2008 to 2012. After subtraction of the commitment period reserve of 243 Mt CO₂e, 92 Mt CO₂e remain, which could theoretically be sold under a GIS. More than half of this amount (50 million AAUs) has been sold in form of an option to the Swiss firm Interblue in a highly controversial deal for the very low price of reported 5.05 Euro per AAU (Point Carbon, 2009f). Japanese companies were assumed to be final buyer of these AAUs. This deal, due to the low price and a non-transparent process, has caused two successive environmental ministers lose their positions, and legal ways to undo the deal were explored by the government. Fifteen million AAUs have already been transferred to the buyer (Point Carbon, 2009g).

The reputational damage Slovakia suffers due to the fact that it does not have a GIS in place is likely to hinder Slovakia from selling additional AAUs in the near future. Also – taking needed reserves into account – only a limited number of AAUs may still be available for sale if Interblue claims the total number of credits which are part of the contract.

2.12 Synthesis of GIS developments

Table 2 summarizes design elements of different GIS schemes. While most of the CEE countries offer predefined GIS programmes buyers can choose from, in Ukraine specific details of greening activities and greening requirements are reached in bilateral consultations.

Several design elements dominate existing schemes. First of all, for most of the AAU sellers energy efficiency and renewables in buildings is a major priority area for GIS. The building sector and most other sectors that countries have chosen for GIS could not well be addressed by JI due to various reasons (large number of small entities, such as households; lack of relevant approval procedures; high prices for PDD/determination/verification, etc.; for more details see Üрге-Vorsatz et al., 2008). Second, a programmatic approach is supported by all selling countries that have relatively mature schemes, such as Hungary, Latvia and the Czech Republic, as well as by some of the “catching up” AAU sellers (Poland, Estonia, and Bulgaria) while simplifying the provisions that such approaches are required to meet under the CDM and JI¹⁰. Third, the governments do not intend to cover 100% of the investment costs of GIS beneficiaries: the latter need to finance a certain share themselves. However, most GIS schemes are designed to reward those who reach more environment-friendly outcomes, e.g., a higher reduction in energy consumption. Some seller countries allow both hard and soft greening, but in practice soft greening plays a rather marginal role and only a small share of AAU revenues is attributed to it. Most buyers so far accepted only AAUs from projects with a high share of hard greening.

In most cases, seller countries try to avoid an overlap between GIS funds and existing national support programmes in order to guarantee additionality, however a few, such as Hungary, allow the use of GIS funds for existing national programmes. Some seller countries are proposing that GIS programmes meet legal, environmental or financial additionality criteria. However, no country so far has set equally stringent criteria to prove additionally under GIS as under JI and CDM.

An important criterion which is used by buyer countries for project choice is the greening ratio of the implemented activities. The greening ratio describes the relation between the amount of AAUs sold and the emission reductions achieved. The greening ratio significantly depends on the agreed time frame used for the greening activity: for example, an energy efficiency activity completed in 2011 will reduce only very little CO₂eq during the first commitment period, i.e., until 2012. If, however, the calculation of the greening period is based on a time period of, e.g., 15 or 20 years, as used by some countries, the greening ratio is much higher. While for some

¹⁰ According to the concept of a programmatic approach under the CDM, activities under a program of activities can occur either simultaneously or throughout the duration of the program. In contrary to a bundling of activities, there is no ex-ante identification of the project sites. A large number of potential participants, which are not known at the beginning, can participate in the program; they can be added to the program at any time.

buyer countries the greening ratio is important, others focus only on the “flow of funds”, i.e., on the actual implementation of the activities agreed upon in the AAU-purchase agreement.

All of the existing GIS schemes envisage monitoring and verification of AAU revenue flows, including international auditors. Regarding the monitoring and verification of emission reductions in contrast to JI (track 2)¹¹ and the CDM, simplified approaches are being developed. Emission reductions are calculated based on measuring energy consumption reductions, on project documentations prepared by authorized persons or on random checks of project implementation in case of programmatic projects.

The GIS picture is still unclear in Romania, Lithuania and Russia as no details of the planned schemes have yet been published.

¹¹Track 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 reductions. JI track 2 has to follow international rules. Some CEE countries aligned their JI Track 1 procedures to Track 2 as required by a number of buyers of the credits.

Table 2. Summary of GIS design elements in CEE countries

Country	Amount of AAUs aimed to be sold	Priority areas	MRV of emissions reductions/revenues	Coverage of project costs	Compatibility with national projects/programmes
Hungary	~At least 45-55 mio AAUs, of which around 11 mio AAUs have already been sold	Energy efficiency in the residential sector, renewable energy for heating, public transport, replacement of household appliances	Financial audit, reported by the MOEW in the format of a report according to ISO 14064 standard; monitoring by advisory board ; annual reports including the achieved emission reductions	Basic grants; bonus based on attained energy efficiency level (labeling system); less than 100% coverage	Hungary allows for support also in areas where other state or EU funding is available
Latvia	~40 mio AAUs, out of which 18.5 mio AAUs sold.	Energy efficiency, fuel switch and increased use of renewables, technologies reducing GHG emissions	Two annual financial reports: 1) tender report; 2) progress report. International auditing by a recognized auditor. Numerous quarterly internal audits by the Internal Audit Department	Less than 100% coverage. For the first tender high intensity of support (85%).	The Latvian GIS does not build on any other national programmes
Ukraine	43 mio have been sold to Japan (public and private). 400 mio a tentative purchase target	Energy efficiency, district heating, and forest management. Priority area strongly depends on the buyers.	Buyers' representative(s) to participate in the MRV. Project performance reports to undergo checks by an independent accredited verifier. Other details stated in the contracts with buyers	Stated in the contracts with buyers that are not publicly available	Information not available

Czech Republic	~100 mio AAUs allocated to GIS, out of which 71 mio AAUs sold.	Energy efficiency and use of renewable energy sources (biomass) in buildings. Other sectors still limited since various support programmes exist	Monitoring Committee consists of the Ministry representatives who meet quarterly. International auditor to monitor financial flows as agreed with the buyer. At least 5% of the projects should be checked on-site	In theory, 100% of investment costs can be covered. But plan that on average ~30-50% are financed by AAU revenues. The amount of support depends on achieved energy consumption reduction	Households living in panel buildings and applying for the GIS funding should not simultaneously participate in the national panel-buildings support program
Bulgaria	Surplus AAU expected to reach ~200 mio	Energy efficiency, use of renewable energy sources, capture and utilization of methane, afforestation, reforestation and other land use change, educational measures, research, capacity building, reduction of non GHG pollutants	Verification of the implementation and achieved results of the projects is done by accredited independent organizations, including organizations accredited by the UNFCCC	Information not available	Information not available
Poland	AAU surplus totals 500 mio (200 mio downgrade from 2008 estimations). first deal on estimated 2.5 mio AAUs in November 2009.	Energy efficiency such as in buildings, clean coal technologies, fuel switch, research and development, capacity building on climate change and industrial processes	National Fund for Environmental Protection and Water Management responsible for verifying beneficiaries' semi-annual reports on AAU money disbursement as well as for reporting yearly to the Ministry of Environment	Information not available	Information not available

Lithuania	Allocation for GIS could total 50 mio AAUs	Energy efficiency and renewable energy in public and residential buildings; possibly also transport, industry and agriculture	Monitoring and verification will most likely involve third party assessments, the specification of which could be part of an AAU purchase agreement	Not decided yet	Information not available
Estonia	Surplus of 85 mio AAUs which can in principle be fully allocated to GIS. 1.4 million AAUs sold to Austria.	Energy efficiency and use of renewables in households and public buildings, energy efficiency of energy infrastructure (e.g., of heating pipes), renewable electricity and transport	Environmental Investment Center responsible for implementation of projects, for monitoring of the energy consumption reduction and the money flow. Participation of a third party verifier is up to a buyer	Information not available	GIS funding is kept separate from other government initiatives.
Russia	Amount of AAUs to be sold within this CP is supposed to be not higher than 100 to 200 mio	Not defined by the country. The World Bank's suggestion is a country-wide exchange of conventional boilers to more efficient ones	The state-owned 'SberBank' is responsible for GIS together with the Ministry of Finance	Not decided yet	Information not available

Table 3 shows a comparison of the 2008 Climate Strategies GIS recommendations (Ürge-Vorsatz *et al.*, 2008) with the GIS developments as of April 2010.

Table 3. Comparison of 2008 Climate Strategies GIS recommendations¹² with the GIS developments as of March 2010

Design element	Recommendation on design elements (2008)	Situation as of March 2010
Greening type and greening ratio	A 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. Regarding a greening ratio, a 1:1 proportion 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.	Hard greening dominates the schemes. However most CEE countries intend to allocate a small share of AAU proceeds for administrative purposes. Even though most buyers do not insist in a strict greening ratio, the greening ratio forms part of the purchase decision criteria.
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 program-based approach has lower transaction costs and can have larger scale roll-out.	A programmatic approach is supported by all selling countries that already have a relatively mature GIS scheme, such as Hungary, Latvia and Czech Republic, as well as by some of the “catching up” AAU sellers (Poland, Estonia and Bulgaria).
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.	All of the GIS host countries have opted for using a special fund or a separate account within a budget to keep AAU funds.

¹² Based on “Table 14. Summary recommendations for GIS architecture design modalities, in order to optimize their impacts for climate and society” from Ürge-Vorsatz *et al.* 2008

<p>Additionality requirements</p>	<p>Additionality is essential for ensuring the environmental integrity of GIS. Three types of additionality may be crucial: financial, legal and environmental additionality. 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 counter-productive for many areas of high priority for GIS in CEE.</p>	<p>No country so far has set equally stringent criteria to prove additionally under GIS than under JI and CDM. Several countries, such as Hungary and Latvia, have set additionality criteria, such as legal and financial additionality. Most countries having a GIS in place so far are opposed to complementing national programmes with the AAU proceeds.</p>
<p>Monitoring and verification of emissions reductions</p>	<p>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.</p>	<p>All of the existing GIS schemes envisage monitoring and verification with a third-party auditor involved and with regular reporting guaranteed to a buying country. The used (or suggested) MRV methodologies for emission reductions are simplified compared to JI/CDM, based on measuring energy consumption reductions, on project documentations prepared by authorized persons or on random checks of project implementation.</p>
<p>Crediting period</p>	<p>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.</p>	<p>A timeframe such as a 15 yrs period is generally used in order to calculate emission reduction in specific sectors. In some areas a substantial amount of co-funding is required.</p>

Funds disbursement period	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 jeopardized if funds are spent compromising the optimal framework in order to expedite disbursement.	Some seller countries, such as the Czech Republic plans to disburse the AAU revenues before 2012. The disbursement before 2012 is apparently important for some buyers (like Spain) while for others (such as the Worldbank) the disbursement period could be longer.
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). Socioeconomic 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.	Most of the AAU sellers have announced that energy efficiency in buildings and a switch from conventional fuels to renewable energy sources are major priority areas for implementing GIS projects. Other prioritized activities include clean coal technologies, capacity building on climate change, biogas production for transportation purposes and forest management.

3 GIS market dynamics

This chapter gives an overview of deals concluded so far and discusses the potential future supply and demand. In addition, the market dynamics are discussed taking into account strategies of sellers and buyers. Supply data are based on own assessments as described in the previous chapter and on existing data. Details of the deals going beyond the traded volumes can be found in chapter 2.

3.1 Background, prices, concluded and expected deals

The AAU market up to now is far from being transparent. Contracts are not publicly accessible and players generally only give indicative information regarding the prices. While greened AAUs were assumed to be traded at about 14 Euro per tone in 2008, the price decreased to a level of about 10 Euro per tone in 2009 and fell below 10 Euro per tone in 2010. The traded volumes are communicated for most of the deals and greening activities are made public by most countries. Some deals remain uncertain as they have been announced but never have been reported as being concluded. This is the case, e.g., for some deals over several hundreds of millions of allowances announced to be sold by Ukraine to private firms in May 2009.

The activities of companies in the AAU market are particularly difficult to assess as companies who purchased AAUs have not revealed who are the potential final buyers. Thus it remains unclear whose demand these credits will in the end address. In a Point Carbon article from June 2009 a private AAU purchase from Slovakia has been suggested as having been transferred to Japan (Point Carbon, 2009). Nevertheless such flows remain opaque as the public information from the registries is not sufficient to follow the transactions in detail.

The following table shows the deals having been reported as concluded to date.

Table 4: AAU deals concluded as of April 2010

Month	Year	Seller	Buyer	Mio AAUs
September	2008	Hungary	Belgium	2
November	2008	Slovakia	Private	15
November	2008	Hungary	Spain	6
March	2009	Ukraine	Japan	30
March	2009	Latvia	Netherlands	3
March	2009	Czech Republic	Japan	40
April	2009	Latvia	Austria	2
May	2009	Ukraine	Japan private	14
September	2009	Latvia	Spain	5
September	2009	Czech Republic	Japan private	20
October	2009	Czech Republic	Austria	3.5
October	2009	Czech Republic	Spain	5
October	2009	Latvia	Japan	1.5
October	2009	Latvia	Portugal	4
November	2009	Poland	Spain	2.5
November	2009	Hungary	Japan private	3
December	2009	Latvia	Austria	1.5
December	2009	Ukraine	Spain	3
n.a.	n.a.	Latvia	Japan private	1.5
March	2010	Czech Republic	Japan private	2.5
April	2010	Estonia	Austria	1.4
TOTAL				166.4

Source: see country chapters above

The table shows that seven sellers and six governmental buyers have been involved in AAU deals so far. Poland entered the market with a first deal concluded in November 2009. Estonia joined as new seller in April 2010. Romania is also expected to prepare for sales during 2010, and Bulgaria has recently drafted a GIS legislation. New buyers are expected to include the World Bank, currently in negotiations with the Czech Republic, Poland and Ukraine. Besides Japan and Spain, Ireland is reported to show interest in Polish AAUs, and would be a new buyer as well. The emergence of Poland as a seller country is of particular significance as the country has the third largest AAU surplus after Russia and Ukraine. It could potentially sell as many or even more AAUs than Russia, which is likely to limit sales to 100 or 200 million AAUs. An overview of the expected supply and demand is given in the next section.

3.2 Potential supply and demand

The potential AAU supply, defined in this chapter as the number of AAUs that countries would like to sell in the first commitment period, is based on the information given in chapter 2 which has been compiled through interviews with country representatives and experts. Most of the EU CEE countries in principle aim to sell their total surplus, however do not expect to be able to sell these amounts given a lack of demand.

Table 5: Potential AAU supply over the period 2008-2012 (MtCO₂eq)

	Total amount aimed to be sold by governments 2008-2012	Amount already sold	Amount that still may be sold
Hungary	50*	11	39
Latvia	40	18.5	21.5
Czech Rep.	100	71	29
Romania	200	0	200
Bulgaria	200	0	200
Poland	500**	2,5	497.5
Lithuania	50	0	50
Estonia	85	1.4	83.6
Ukraine	400****	47	353
Russia	200	0	200
Slovakia	92**	15 (50)***	77(42)
Total	1917	166	1751

* In 2008 Hungary's plan was to sell 50 mio AAUs, currently Hungary is supposed to try to sell more

** The number represents the entire surplus which may not entirely be offered. No governmental target was available. Poland, as most EU CEE countries, indicated that it would like to sell its total surplus.

*** 50 million AAUs were contracted by Slovakia but only 15 mio have been reported transferred (see 2.11 above).

****It is unclear at the moment how much Ukraine plans to sell, in the past an indicative target of about 400 million was mentioned.

These roughly 1.9 billion AAUs that countries would like to offer on the market compare to an estimated total (gross) shortfall of around 2.6 billion tons without or 3.7 billion tons with Canada¹³ over the first commitment period taking the economic recession into account (Point Carbon, 2009a, Société Générale, 2009). The net shortfall taking CER and ERU supply into account was estimated by Point Carbon to be 1,079 mio (Point Carbon, 2009h) and by Société

¹³ This illustrates Canada's large shortfall but the country is not expected to act as buyer.

Générale to be 1,300 mio (Société Générale, 2009) which may prevent full absorption of offered AAUs by the market. Due to a possible lower price of AAUs than CERs and ERUs they may influence these markets with consequences for project development and implementation as well as credit prices. Point Carbon in 2010 significantly revised its estimates on the net shortfall down to 59 Mt arguing with a reduced expectation of demand from EU ETS participants in phase 2 and the inflow of AAUs in the market (Point Carbon, 2010e). Given the oversupply of AAUs, the market is buyer oriented, and sellers need to address the demand for greened AAUs. However, not in all of the deals concluded so far greening activities were defined in detail.

The above mentioned amount of AAUs that countries would like to offer is far below the total AAU surplus of CEE countries which is estimated to be between 8 and 12 billion (Société Générale, 2009; Point Carbon, 2009a) and that does not take into account strategies of the seller countries and reserves to be kept, e.g., for JI and own compliance. In addition, AAUs not offered now might be banked and be traded post-2012¹⁴ (see chapter 3.4 below).

3.3 Key buyers' strategies

Given the current significant oversupply of AAUs and the resulting buyer's market, it is of major interest on which criteria potential buyers base their purchase decisions. Key criteria for buyer's to choose a seller country include the AAU price, the presence and quality of a greening scheme, the greening ratio as well as existing cooperation between countries. Buyers may be interested in using GIS to strengthen economic relations to the host countries. In addition, some buyer countries have an interest in greening activities which may offer opportunities for technology transfer. Technology transfer can in fact form part of an AAU deal, as has been reported to be the case in a GIS deal between Japan and Ukraine. The following sections provide information on GIS strategies of Japan, the Netherlands and Spain showing the broad range of reasons for the participation in the AAU market and for the selection of seller countries. The potential future demand is discussed as well.

3.3.1 Japan

The Japanese government and Japanese companies so far have been the largest buyers on the AAU market. Japan had initially planned to cover a large share of its Kyoto gap with CERs/ERUs. But given the country's increasingly negative perception of the CDM and possible lower prices for AAUs than for CERs/ERUs, Japan preferred buying AAUs. The Japanese government had interest to buy from a range of different seller countries. Ukraine for instance would have been capable to deliver much more than the traded 30 million AAUs in

¹⁴ The use of AAUs for national compliance in principle extends to 2015. After the completion of the review of the final annual reports for the commitment period in 2014 parties can continue making transactions for a period of 100 day for the purpose of 'truing up' any remaining differences between Parties total emissions during the commitment period and units retired for compliance. Thus, even if banking is restricted or no new international AAU-based climate agreement is decided on, AAU trading might be possible up to 2015.

March 2009. In addition to concluded deals with Ukraine, the Czech Republic and Latvia, Japan had considered to buy further AAUs from Poland (Point Carbon 2009a). Reasons for the selection of a high diversity of seller countries may include an interest in strengthening relations with the governments and technology exports. Another reason may be diversifying the risks related to the implementation of appropriate GIS schemes in the seller countries going along with reputational risks for the Japanese government. In particular speculations about whether Ukraine would implement an environmentally credible GIS may have hindered Japan from further buying AAUs from Ukraine. The additional demand by the Japanese government is currently difficult to predict, but latest reports do not indicate an additional demand in 2010 (Point Carbon, 2010a).

In Japan also companies can purchase AAUs to meet voluntary domestic targets under the so called “Keidanren’s Voluntary Action Plan”. Within this plan companies can take targets based on total CO₂ emissions, CO₂ intensity, energy consumption, or energy intensity. Furthermore, companies can buy and use CERs, ERUs, and AAUs without any limitation to comply with their targets. To date, of these instruments, companies have primarily used CERs, reflecting Japan’s geographical interests as well as fear of creating a negative impression through a heavy reliance on hot air (Kimura et al., 2008). Since Green Investment Schemes are being implemented, there is increasing interest among Japanese companies in purchasing AAUs, and several deals involving Japanese companies have been concluded (Kimura et al., 2008).

Regarding additional AAU demand by Japanese companies, Natsource stated that it will not exceed 3-5 million AAUs during the first commitment period (Personal communication 10, 2009). Demand by Japanese companies could, however, be higher. Japanese companies may engage in low cost AAU deals enabling them to sell more costly CERs previously purchased. While the Japanese government did care about reputation, Japanese companies are rumored to be involved in low-cost deals with no or only limited greening.

3.3.2 The Netherlands

On March 25, 2009, the Netherlands bought three million AAUs from Latvia (see chapter 2.2). The country currently does not intend to buy any more AAUs. The Dutch purchase target was initially to buy 100 mio international credits, but then was reduced to 65 mio. The country has so far purchased 45 mio CERs and 25 mio ERUs (incl. 3 million AAU’s) an amount that may be too large given the current economic crisis (Henkemans, 2010).

The main reason for buying AAUs was to acquire experiences with GIS and to support the development of this new mechanism. The Netherlands approached several countries including Hungary, Latvia, Romania, and Ukraine. Finally, Latvia was chosen as a partner due to the reliability of its government and a credible institutional framework (Personal communication 14, 2010). Even though the Netherlands as a buyer could influence the projects’ choice in Latvia, the main criterion for project selection was the importance of a certain programme for Latvia. The Dutch government required that all AAU revenues are channeled into hard greening, i.e.,

in this case in energy efficiency and/or renewable energy projects (Personal communication 14, 2010).

3.3.3 Spain

The government of Spain intends to purchase about 160 million tCO₂eq during the first commitment period (Personal communication 12, 2009). However the share of the different types of Kyoto credits that Spain plans to use to comply with the Kyoto target, i.e., the choice between CERs, ERUs and AAUs is not clear. According to a governmental official, CERs and ERUs are preferred to AAUs as “Spain favours the development and reform of market mechanisms such as CDM and JI” (Personal communication 12, 2009). AAUs are intended to fill the gap that CERs and ERUs will not cover due to delays in project registration and issuance. Nevertheless Spain has concluded several AAU deals, is negotiating with the EBRD, and has commissioned the World Bank with the purchase of AAUs.

There is a list of requirements that a selling country should strictly comply with, such as, *inter alia*, additionality, depositing AAU proceeds to an extra-budgetary account/fund, allowing a programmatic approach, providing flexibility without compromising environmental integrity, the cost-effectiveness of measures and a simplified MRV process (Personal communication 12, 2009, Huarte-Mendicoa, 2009). Until summer 2009, the country supported GIS investment only during the first commitment period, but has changed its position and accepts later investments. Spain is open to various sectors and crediting periods. Although hard greening is a preferred option, a certain share of AAU proceeds may be channeled to soft greening options such as GIS-related management, marketing, and technical assistance. Hard greening options that Spain would like to see implemented include measures related to renewable energy sources, municipal solid waste, water management, and energy efficiency in buildings and industry (Personal communication 12, 2009).

3.4 The big unknowns

As set of factors will influence the AAU market up to and possibly beyond 2012. In the following subsections, several factors related to future supply, such as the often-discussed question of AAU banking, and aspects of future demand are discussed in more detail.

3.4.1 The supply side: post 2012 uncertainty and limited implementation capacity

This chapter discusses several issues that are likely to influence the future supply of green AAUs. These include the question whether there will continue to be AAU trading and whether banking AAUs into a post 2012 period will be possible. Also possible limitations of the capacity of host countries to offer credibly greened AAUs are discussed.

To bank or not to bank – is that the question?

The right to bank AAUs, i.e., to keep them for use during a post-2012 commitment period was often discussed as an important factor for the decision of seller countries on how many AAUs to offer until 2012. In this context, the behavior of Russia as the country with the highest AAU surplus is often seen as the most important factor. However, decisions on banking rules are only relevant in case there is an international AAU-based climate agreement. The current situation is dominated by the outcome of the Copenhagen conference in December 2009 which did not lead to such an internationally binding post-2012 regime. In the absence of a new agreement, the question of banking may be obsolete as AAUs may have no value after 2012 at all. At the same time, the lack of a new agreement may have comparable effects on the AAU market as a restricted banking. Both may motivate AAU sellers to sell a higher amount of AAUs before 2012 than initially planned. The following paragraphs provide some thoughts on the effects of the outcome of international negotiations on the market.

In case there is an internationally binding Kyoto-style agreement after 2012 it is unlikely that banking will be completely abandoned. The right to bank AAUs is part of the Kyoto Protocol. Restricting the banking of AAUs would require a far-reaching change of the existing rules which, for example, Russia may reject. Statements of the Russian government in 2009 indicated that the country is not willing to question banking and wants to keep the AAUs as a “strategic reserve”. In addition, a generous allocation of AAUs along with the argument that AAUs may be sold in the future was essential for Russia’s ratification of the Kyoto Protocol. Insisting on abolishing banking could threaten Russia’s participation in a future agreement. A number of proposals dealing with banked AAUs have recently been made by some EU countries holding an AAU surplus.

Poland, for example, has proposed to restrict the amount of annual sales of AAUs including those backed by “greening” initiatives to 10-20 % of the overall AAU surplus. According to Poland’s proposal, buyers would be restricted to use purchased AAUs to not more than 10-40 % of their 2020 emissions targets. Depending on the percentage chosen, the effect of such

decisions may rather be an equal spreading of sales over the period 2012-2020 than to limit the overall number of AAUs entering the market and to avoid an impact on the stringency of emission targets. An annual limit on sales may primarily serve to protect the market from an excessive number of AAUs entering the market in a short period of time. Poland's proposal also includes an earmarking of a share of AAU revenues for an adaptation fund for developing countries. Hungary and Lithuania have proposed mandatory "greening" of surplus AAUs, with Hungary also suggesting to deepen emission reduction targets of Annex-1 countries to compensate for AAU banking (Point Carbon 2009d, e). The uncertainty regarding a new international AAU-based agreement or restricted banking of AAUs in case a new international agreement is adopted, however, may pressure seller countries to offer more AAUs in the short term, even without strict greening provisions.

Another factor influencing future AAU supply is that sellers may want to maximize their profit instead of just getting rid of their AAU surplus and thus have an interest in keeping the price on a certain level. The amount of greened AAUs entering the market may therefore be far below the existing surplus.

Limits of the supply of green AAUs

Also the financing and implementation capacity of the AAU suppliers may limit the supply of green AAUs. In most cases, the proceeds from AAU sales cover only a part of the investment costs of the greening activities. The remainder has to be financed either through capital markets, state subsidies, or from the beneficiaries. Raising such cofunding has proven to be difficult, in particular in the current economic crisis. In addition, it has been a challenge for most seller countries to carry out large numbers of greening activities. Both, the Czech and Hungarian GIS plan tens of thousands of individual activities within the greening programmes. The slow start of some of the GIS is another indication that the potential to generate "greened" AAUs may not be exhausted in a short timeframe. In some cases there have been difficulties in identifying greening activities acceptable to the buyer. In Ukraine for example there are not enough suitable projects available to fulfill the country's obligations under the signed contracts with Japan and Spain (Personal communication 15, 2010).

3.4.2 The demand side: reputation concerns and post-2012 uncertainty

Several buyer countries, including the Netherlands, Austria, and Belgium, purchased AAU only in countries with a clear and transparent GIS and it can be assumed that these players's behavior continues. The largest buyers however -- Japan (the government as well as private companies) and Spain -- concluded deals also in countries, such as Hungary and Ukraine, where there is a lack of clarity regarding important elements of a credible GIS, such as the additionality of emission reduction measures. In particular Japanese companies were suggested to be involved in low cost deals with no or only limited greening.

If credibility continues to be an important factor in purchases, limitations on CEE countries to design and implement credible GIS may limit the supply of salable GIS-backed AAUs. The total

amount of AAUs possibly entering the market may be less important for the development of credit prices than the amount of “green” AAUs being offered for sale. In this case the market dynamic will heavily depend on how much time large seller countries will need to set up Green Investment Schemes that satisfy the buyers’ needs.

Another factor influencing the demand for AAUs will be whether nations or regions, particularly the US and EU, will accept the continuation of AAU use after the current commitment period. Both the EU and the US have shown skepticism towards use and trade of AAUs. It may turn out that the international trade of the current AAU surplus will not be limited by factors influencing the offer but rather by a lower or even non-existing demand.

3.5 Synthesis of market dynamics

The developments so far have shown that the AAU market is very diverse in terms of implementing GIS in the seller countries as well as in terms of priorities on the part of the buyers. It is obvious that the success of a country to sell AAUs does not depend purely on the price offered but also on a number of different criteria which vary significantly among the buyer countries. The most successful sellers so far in terms of concluded deals have been Latvia in terms of the number of concluded deals and the Czech Republic in terms of the total volume sold. Both countries have a GIS in place with transparent rules for monitoring and verification of emissions reductions and financial flows. In addition, both do not complement existing national subsidy programmes with the AAU funds preventing additionality concerns.

Other countries have had more mixed records due to weaknesses in their GIS programmes. Even though Hungary was one of the “early movers” regarding the setup of a GIS and the first country which concluded an AAU deal, it suffered reputational problems due to the uncertainty of revenue spendings and additionality concerns. Slovakia lost access to the AAU market due to its controversial deal with Interblue and as yet has been unable to establish a sufficiently credible GIS to re-attract buyers. Ukraine, even though having the largest potential amount of AAUs to offer among the countries participating in the market so far (Russia has not entered the market yet), has only concluded three deals as of April 2010. While Ukraine has sold the second largest amount of AAUs (47 million in a single deal with Japan) after the Czech Republic (71 million), the absence of a clearly defined investment and greening scheme may have hindered Ukraine from concluding additional deals. Recently Ukraine has shown more ambition in implementing a credible approach to GIS, involving buyers in project and programme design. As a consequence, a number of potential deals are now under discussion with the EBRD, the EIB and the World Bank. New seller and buyer countries, namely Poland, Portugal and Estonia, entered the market in late 2009/early 2010 and more countries such as Bulgaria and Romania are expected to enter the market soon.

The choice of a seller country often includes interest in strengthening economic relations to the host countries and governments and possible options for technology exports.

As the supply of AAUs is much larger than the demand the impact of GIS initiatives on the market will depend on purchaser requirements, particularly requirements for credibility of GIS. Most public buyers chose seller countries carefully, buying only AAUs, which will be greened in a clear and transparent way. Some large AAU buyers, however, including in particular Japanese companies, concluded deals also in countries where there is a lack of clarity regarding important elements of a credible GIS.

As a consequence of these developments, it is anticipated that the future AAU market will depend on more than just supply and demand in terms of AAU amount and price. If credibility continues to play an important factor in purchases, limitations on CEE countries to design and implement credible GIS may limit the supply of salable GIS-backed AAUs. Experiences so far have shown that a number of barriers have emerged when implementing greening activities. Lack of funds to co-finance credible GIS has been a problem for CEE countries, particularly in the current economic crisis. Limited implementation capacity of host countries constitutes another barrier. Therefore, the supply of credible GIS-backed AAUs may be significantly limited in the short term.

In addition to credibility issues, AAU supply and demand will depend on the impacts of the Copenhagen conference and future climate agreements. The Copenhagen conference increased uncertainty in the AAU market by opening the possibility that international AAU trading will end after 2012, with the consequence that AAUs may have no value after 2012 or that banking of AAUs will be restricted. This situation may increase the pressure on CEE countries to sell as many of their AAUs as quickly as possible. The consequence is an increased temptation to sell AAUs of lower credibility and at lower prices. Buyers on the other hand may be hesitant to purchase more credits than they will actually need until 2012 if it is not clear whether they can bank them. In such a case, an increased offer and a lower demand may decrease the AAU price even without a market "flooding" in form of massive AAU amounts entering the market. It may turn out that the international trade of the current AAU surplus will not be limited by factors influencing the offer but rather by a low or non-existing demand.

4 Lessons for new carbon finance mechanisms?

The Kyoto Protocol provides for the carbon-market mechanisms Joint Implementation (JI) in industrialized, and the Clean Development Mechanism (CDM) in developing countries. Experiences show that not only JI, but also the CDM has largely failed to deliver in a couple of mitigation areas with the high sustainability benefits. These areas include, but are not limited to, energy efficiency in the buildings sector, forestry, and small- and medium-scale bioenergy. There are several reasons why the carbon market has failed in these areas. For energy efficiency (EE) in buildings, for example, there are significant barriers for the approval of new methodologies, including the difficulty to pass the additionality assessment due to the economic viability of EE projects themselves and the difficulty to calculate the emission reductions. In addition, there are often non-financial barriers, which hamper the project implementation. Barriers specific to CDM/JI land-use projects are the need for large upfront investments and long crediting periods which lead to a delayed and potentially low rate of return. In addition, the development of the complex documentation for JI and CDM projects is costly and time-consuming. The project-by-project approach hinders a broad consideration of the national and local context and an integrated implementation of interwoven activities. This is in particular true for JI, where programmatic approaches are only slowly developing, while there are already some experiences with the programmatic CDM approach.

In order to address the above described difficulties, in particular with the CDM, under the current UNFCCC negotiations so-called National Appropriate Mitigation Actions (“NAMAs”) are discussed as a possible voluntary action by developing countries to mitigate climate change.¹⁵ NAMAs could be driven by the carbon markets or by new, fund-based, mechanisms. To date, under the current Kyoto approach, there are no fund-based mitigation instruments.

The country studies show that host countries are implementing GIS, which actually is a fund-like mechanism, in those areas where JI has failed and which are of strategic importance for the host countries including energy efficiency in buildings and renewable energy sources in households. Forestry projects are envisaged in some cases. On the contrary to JI, GIS provides upfront financing and is not restricted by limited crediting periods. The country studies show that GIS focus on bundling similar projects or on programmatic approaches while simplifying the provisions under the CDM and JI.

Fund-based NAMAs in developing countries could be the way forward for those sectors that cannot be easily targeted by the carbon market while retaining market-based instruments where they proved to be appropriate. Experiences with simplified MRV-approaches under GIS could be helpful for the development of fund-based NAMAs. Approaches under GIS may not necessarily compromise the environmental integrity of the projects and programmes. Under GIS, monitoring, evaluation and reporting requirements are in theory rather stringent for a

¹⁵ See article 1.b (ii) of the Bali Action Plan

number of countries. In addition to the implementation of the scheme by the host country, the buyer (at least in some cases) has the right to review the reports and, if emissions reductions are not achieved and/or agreed greening factors are not reached, to propose remedies and strategy changes in the programme. Also experiences with the way the AAU-revenue flows and emission reductions are monitored could be helpful for the development of international fund-based mechanisms. In several cases, internationally recognized auditors are selected by both the buyer and the seller country in order to carry out audits of revenue flows and GIS investments in a number of host countries. The practical experiences with approaches under GIS, however, are so far limited.

Market dynamics have shown the importance of players' reputation and mistrust regarding the implementation of greening activities is common on the side of the buyers, going along with the fear to worsen their own reputation. Given these circumstances among a relatively small number of players involved, with most of them being geographically relatively close to each other, we conclude that international funds based mechanisms approaches under NAMAs will need a very cautious approach towards implementation agreements and M&E in order to minimize mistrust and malfunctioning. An important difference in this matter is the fact that GIS, so far, are different in each country. A homogeneous approach under, e.g., UNFCCC, taking into account the different capacities of developing countries, may help to reduce discrepancies between recipients and to establish standards which are currently not harmonized under GIS.

5 Conclusions

The surplus AAUs held by CEE countries provided an additional opportunity for their participation in the Carbon Market. The inception of GIS some two years ago opened a pathway to this participation and has resulted in an active AAU market. Some 165 million GIS-backed AAUs have been put on the market, representing a value of around 1.6 billion Euro. This is only a small fraction of the roughly 1.9 billion AAUs that seller countries currently would like to offer on the market. Most EU CEE countries have indicated that they would like to sell their total surplus.

The report shows that most AAU seller countries take advantage of GIS to focus on mitigation opportunities which are not well-suited to -- and which lie outside of the prime targets of -- Joint Implementation (JI) but are of long-term strategic importance. Improved energy efficiency in buildings provides a prime example of such opportunities. The project-based orientation of both JI and the CDM for example poses hurdles where small reductions by many actors are needed. Under GIS, programmatic as well as project-based initiatives are possible, while simplifying the provisions that such approaches are required to meet under the CDM and JI.

Several issues dominate decisions on implementation and acceptance of a GIS. These include the MRV system to be used, whether or not revenues from sale will be used to supplement already existing programmes, and the amount of the reductions achieved per Euro paid. The absence of internationally approved MRV systems for GIS has encouraged the development of simplified MRV approaches for emission reductions. Emission reductions are monitored for example based on reductions in energy consumption, or by verified random checks. Most countries participating in GIS schemes have proposed in theory credible mechanisms to monitor and verify emission reductions and AAU revenue flows, using, for example, independent audits by recognized international auditors and existing, and well known national institutions. Recently, the issue of additionality has gained increased attention, as in some cases there was concern that GIS funds may be used to finance programmes for which the state support has been reduced and thus compensate budgetary problems. Most countries therefore avoid an overlap between GIS funds and existing national programmes and some are proposing that GIS programmes meet legal, or financial additionality criteria.

As the possible supply of AAUs is much larger than the demand, the impact of GIS initiatives on the market will depend on purchaser requirements, particularly requirements for credibility of GIS. The report indicates that most public buyers chose seller countries carefully, buying only AAUs which will be greened in a clear and transparent way. Large AAU buyers, including private companies, however, concluded deals also in countries where there is a lack of clarity regarding important elements of a credible GIS. Such transactions, however, have led to reputational consequences for both buyer and seller. As a result, most sellers have made significant efforts to increase credibility. The report shows that the choice of a seller country often includes also the interest in strengthening economic relations to the host countries and in

possible technology exports. If credibility continues to be an important factor in purchases, limitations on CEE countries to design and implement credible GIS may limit the supply of salable GIS-backed AAUs. Experiences so far have shown that a number of barriers have emerged when implementing greening activities. Lack of funds to co-finance credible GIS has been a problem for CEE countries, particularly in the current economic crisis. Limited implementation capacity of host countries constitutes another barrier. Therefore, the supply of credible GIS-backed AAUs may be significantly limited in the short term. However, if credibility fails to be a critical issue for major buyers, very inexpensive non GIS-backed AAUs could be brought onto the market, depressing prices. In addition to credibility issues, AAU price development will depend on the decreasing demand for AAUs and the ongoing uncertainty regarding banking of AAUs. The Copenhagen conference increased uncertainty in the AAU market by opening the possibility that international AAU trading will end after 2012, with the consequences that AAUs will have no value after 2012. This situation has increased the pressure on CEE countries to sell as many of their AAUs as quickly as possible. The consequence may be increased temptation to sell AAUs of lower credibility and at lower prices.

While several countries have made significant progress in implementing GIS schemes and in principle environmentally credible GIS mechanisms have been worked out, the available practice with GIS is limited. In particular there is a lack of experience with the long-term enforcement of GIS activities. Such enforcement is the responsibility not only of sellers, but also of buyers. While some buyers follow up on the implementation and enforcement of GIS activities in the seller nations, other buyers may fail to do so, possibly undermining the integrity of the mechanism.

Looking ahead, experiences gained from current GIS schemes, particularly simplified approaches for MRV and additionality, may prove helpful in conjunction with the development of fund-based support mechanism for developing countries after 2012. Further, GIS has provided insight into how to tackle a range of reduction opportunities not easily addressed through either JI or the CDM. The experiences also have highlighted the critical role of institutional capacity and the role of purchaser integrity and responsibility in ex-ante funding of GHG reduction initiatives. In case the AAU market continues to be a part of future international agreements, proper integration of these lessons can contribute to the carbon market strength.

6 References

- Andrei, L, A Relicovschi, and V Toza. 2006. Developing a Green Investment Scheme in Romania: Regional Environmental Center for Central and Eastern Europe.
- Bisters, V., 2010. GIS as Testing Ground for Post-Kyoto Flexible Mechanisms. Presentation held at the 6th Austrian JI/CDM Workshop, 27-29 January 2010, Vienna
- Blyth, W, and R Baron. 2003. GREEN INVESTMENT SCHEMES: OPTIONS AND ISSUES. Paris: Organisation for Economic Co-operation and Development, International Energy Agency.
- Budzanowski, M. 2008. Overview of the Polish position towards Green Investment Scheme (GIS): Simple ideas to accomplish great things. Presentation at the World Bank Regional GIS Forum, Warsaw, 25 June 2008
- Bulgarian Government, 2010. Draft GIS legislation
- Feiler, J. 2008. GIS in Hungary: Context and architecture. Presentation held at the workshop "Facilitating Green Investment Schemes: first lessons learnt and way forward". April 24-25, 2008, Budapest, Hungary.
- Fiala, M. 2010. Green Investment Scheme: Moving forward. Presentation held at the 6th Austrian JI/CDM Workshop, 27-29 January 2010, Vienna
- Filonenko, O. World Bank involvement in GIS development. Presentation at CEU/REC Workshop, 25 April, Budapest.
- Gorina, N. 2006. Cooling down hot air. GLOBAL CARBON, http://www.icfi.com/Markets/Energy/doc_files/surplus-aau.pdf.
- Government of Estonia, 2010. Official documentation on GIS.
- Government of Hungary, 2007. Act LX. 2007. Act LX of 2007 on the implementation framework of the UN Framework Convention on Climate Change and the Kyoto Protocol thereof, edited by H. Government.
- Government of Hungary, 2007. Government Decree 323/2007. (XII. 11.) on the implementation of Act LX of 2007 on the implementation framework of the UN Framework Convention on Climate Change and the Kyoto Protocol thereof, edited by H. Government.
- Government of Hungary 2007. Green Investment Scheme in Hungary BRIEFING: Ministry of Environment and Water.
- Government of Hungary, Ministry of Environment and Water, 2010. Official communication on GIS.
- Government of Ukraine, Decree No. 221. 2008. The Procedures for Consideration, Approval, and Implementation of the Special-purpose Environmental (Green) Investment Projects During the Period of Obligations of Parties to the Kyoto Protocol of the UNFCCC. Government of Ukraine
- Huarte-Mendicoa, P. 2009. In Time for Compliance: GIS Role. Presentation. 17-19 March 2009. Copenhagen, Denmark.

ICIS Heren, 2010. Romania could begin AAU sale within year. 17 Feb 2010.
<http://www.icis.com/heren/articles/2010/02/17/9335657/emissions/edcm/romania-could-begin-aau-sale-within-year.html>

Kimura, H., Andreas Tuerk, (2008). Emerging Japanese Emissions trading schemes and prospects for linking - Climate Strategies Working Paper

National Environmental Investment Agency, 2009. Ukraine's Activities under the UNFCCC and KP. Kiev.

Point Carbon 2009. Japan linked to Slovak AAU deal. Point Carbon, 02 June 2009

Point Carbon 2009a. Assigned Amount Unit: Seller/buyer analysis and impact on post-2012 climate regime. Point Carbon advisory for CAN Europe, 26 October 2009

Point Carbon 2009b. Poland eyes \$35 million AAU revenue. Point Carbon, 10 September 2009

Point Carbon 2009c. Hungary sells AAUs to Japanese firm. Point Carbon, 26 November 2009

Point Carbon 2009d. EU to delay AAU-banking decision until Copenhagen. Point Carbon, 24 November 2009

Point Carbon 2009e. Poland proposes AAU-banking solution. 26 November 2009

Point Carbon 2009f. Slovakia obliged to sell 50m AAUs to Interblue. 16 June 2009

Point Carbon 2009g. Slovakia backpedals on AAU promise. Point Carbon, 2 November 2009

Point Carbon, 2009h. Carbon Market Analyst – The Kyoto and credit balances: Saved by the recession? Point Carbon Research, 12 March 2009

Point Carbon, 2009i. The Polish government will get the green light to sell Kyoto emission units by early September. Point Carbon News, 20 July 2009

Point Carbon, 2009j. Hungarian GIS gets Spanish backing. Point Carbon, 01 December 2009

Point Carbon, 2009k. Ukraine sells 3 million AAUs to Spain. Point Carbon, 04 December 2009

Point Carbon, 2009k. 091120 Hungary loses €500m after GIS fiddle. Point Carbon, 20 November 2009

Point Carbon, 2010a. Japan to stick to carbon purchase plan. Point Carbon, 18 January 2010

Point Carbon, 2010b. Czechs sell 2.5 million AAUs to Mitsui. Point Carbon, 17 March 2010

Point Carbon, 2010c. Lithuania to hold AAU tender, Point Carbon, April 2010

Point Carbon, 2010d. Estonia, Austria ink AAU deal, Point Carbon, 7 April 2010

Point Carbon, 2010e. Kyoto and credit markets: More or less in balance. Analyst Update, February 2010

Polish Ministry of the Environment, Department of Climate Change and Atmosphere Protection, 2009. The Green Investment Scheme (GIS) in Poland.

Skrockaite, A. 2008. Lithuania: in position to GIS. Presentation held at the workshop "Facilitating Green Investment Schemes: first lessons learnt and way forward". April 24-25, 2008, Budapest, Hungary.

Société Générale, 2009. Kyoto CO2-Market – AAU: The Market can take a bit more. Commodities Research Fundamentals Update, April 2009

- Tangen, K, A Korppoo, V Berdin, T Sugiyama, S Egenhofer, J Drexhage, O Pluzhnikov, M Grubb, T Legge, A Moe, J Stern, and K Yamaguchi. 2002. A Russian Green Investment Scheme: Securing Environmental Benefits From International Emissions Trading Climate Strategy.
- Ürge, D., A. Tuerk, M. Sharmina, J. Feiler, L. Qiao. 2008. Green Investment Schemes: Maximizing Their Benefits for Climate and Society. Convened by Climate Strategies. Available at <http://www.climatestrategies.org/our-reports/category/36/104.html>
- UNFCCC, 2006a. Hungary's Initial Report under the Kyoto Protocol: United Nation Framework Convention on Climate Change.
- UNFCCC, 2006b. Ukraine's Initial Report under the Kyoto Protocol: United Nation Framework Convention on Climate Change.
- UNFCCC, 2007a. Report of the review of the initial report of Latvia: United Nation Framework Convention on Climate Change.
- UNFCCC, 2007c. Report of the review of the initial report of the Czech Republic: United Nation Framework Convention on Climate Change.
- UNFCCC, 2007d. Report of the review of the initial report of Romania According to: United Nation Framework Convention on Climate Change.
- UNFCCC, 2007e. Report of the review of the initial report of Lithuania: United Nation Framework Convention on Climate Change.
- UNFCCC, 2007f. Report of the review of the initial report of Slovakia: United Nation Framework Convention on Climate Change.
- UNFCCC, 2008a. Report of the review of the initial report of Bulgaria: United Nation Framework Convention on Climate Change.
- UNFCCC, 2008b. Report of the review of the initial report of the Russian Federation According to: United Nation Framework Convention on Climate Change.
- UNFCCC, 2010. Report of the individual review of the annual submission of the Czech Republic submitted in 2009.
- Valentová, M., 2009. The Green Investment Scheme in the Czech Republic – Green Savings UNFCCC, 1997. Kyoto Protocol: UNFCCC.
- World Bank, 2004. Report on Options for Designing a Green Investment Scheme for Bulgaria, World Bank, Energy & Infrastructure Department Europe and Central Asia Region And Carbon Finance Unit, October 4, Washington, DC.
- World Bank, 2005. Options For Designing A Green Investment Scheme for Bulgaria: World Bank.
- Zborowska, I., 2010. Domestic Offsets - first experiences, Poland. Presentation held at the Roundtable: Domestic Offsets under Article 24 (a) – Harmonisation of initiatives to reduce emissions from non-EU ETS sectors under Article 24 (a) of the EU ETS Directive. 1 March 2010, Brussels.

Personal communications

[Personal communication 1] Martin Fiala, Czech Republic Ministry of Environment and Water, Department of Climate Change

[Personal communication 2] Jozsef Feiler, formerly with the Hungary Ministry of Environment and Water, Climate Change Policy Department

[Personal communication 3] Ilze Pruse, Latvia Ministry of Environment, Climate and Renewable Energy Department

[Personal Communication 5] Hannu Lamp, Estonian Ministry of Environment

[Personal Communication 6] Helmut Schreiber, World Bank

[Personal communication 7] Russia Ministry of Economic Development and Trade, Department of State Regulation of Tariffs, Infrastructural Reforms and Environmental Economics

[Personal communication 8] Taras Bebeshko, Ukraine National Environmental Investment Agency

[Personal communication 10] Natsource Japan Co., Ltd.

[Personal communication 11] Laura Dzelzyte, Ministry of Environment of the Republic of Lithuania

[Personal communication 12] Pedro Huarte-Mendicoa, Ministry of the Environment, and Rural and Marine Affairs of Spain

[Personal communication 13] Bistra Nikolova, Bulgarian Ministry of Environment and Water

[Personal communication 14] Maurits Henkemans, Ministry of Economic Affairs

[Personal communication 15] Olga Semkhiv, Point Carbon, Kiev

[Personal communication 16] Dorota Zawadzka-Stepniak, Department of Climate Change and Atmosphere Protection Polish Ministry of the Environment

[Personal communication 18] Maurits Henkemans, Ministry of Economic Affairs

[Personal communication 19] Olga Semkhiv, Point Carbon Kiev