Green Investment Schemes: The AAU market between 2008 and 2012

DISSCUSION PAPER

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Acronyms
AAU Assigned Amount Unit, one AAU corresponds to one tCO2eq
CDM Clean Development Mechanism
CEE Central and Eastern Europe
CER Certified Emission Reduction
CHP Combined Heat and Power
CO2eq Carbon dioxide equivalent
COP Conference of the parties
CP Commitment Period of the Kyoto Protocol
EB Executive Board of the UNFCCC
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
MoU Memorandum of understanding
MRV Monitoring, reporting and verification
CO2eq Carbon dioxide equivalent
UNFCCC United Nations Framework Convention on Climate Change
EXECUTIVE SUMMARY

The former centrally planned economies – CEE countries, plus Russia and Ukraine – have an estimated 12.6 billion surplus of carbon emissions rights. 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 provides for the trade of AAUs between Annex-I countries to comply with their emission reduction targets (“International Emissions Trading”). 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 (see Tuerk et al, 2010). Under GIS, revenues from sales of AAUs are invested in “green” activities, ones designed to assist climate change mitigation. As no international rules for GIS exists, the programmes or activities in which the revenues are to be invested must first be accepted by both the selling and buying governments (see Tuerk et al, 2010). The surplus AAUs held by CEE countries provided an additional opportunity for their participation in the carbon market. The inception of GIS opened a pathway to their participation and has resulted in an active AAU market. Around 445 million GIS-backed AAUs have been on the market, representing a value of around 1.6 billion Euro – giving an average price of Euro 3.5. This represents only a fraction of the roughly 2 billion AAUs that seller countries could offer on the market. The impact of GIS-backed AAUs on the global carbon market became significant since 2012 as large amounts of low cost AAUs were traded.

This report assessed the strengths and weaknesses of established GISs, its role as a carbon finance instrument and recent market dynamics along with seller and buyer countries’ strategies. The developments in the AAU market have shown that it is highly diverse both in terms of implementation in seller countries and with regards to priorities of buyer countries. The most successful sellers in terms of concluded deals have been Estonia and the Czech Republic – both countries have a credible GIS in place with transparent rules for monitoring and verification of emissions reductions and financial flows. In addition, none of them complements existing national subsidy programmes with the AAU funds preventing additionality concerns. Other countries had more mixed records due to weaknesses in their GIS programs. Even though Hungary was one of the “early movers” regarding the setup of a GIS and has been the first country to have concluded an AAU deal, it suffered reputational problems due to the uncertainty of revenue spending that continued up to now. Slovakia lost access to the AAU market due a controversial deal and is currently trying to establish a sufficiently credible GIS in order to re-attract buyers. Ukraine, even though it has the second largest potential amount of AAUs to offer, has only concluded three deals. The absence of a clearly defined investment and greening scheme and the political situation hindered Ukraine from concluding additional deals. In addition Ukraine was temporarily suspended from AAUs trading by the UN as were Romania, Bulgaria and Lithuania. Estonia joined the market late, but has taken the position of a major seller in the market. Poland finally emerged as major seller in terms of volumes in 2012.
Several design elements dominate existing GISs, the major ones are the following:

- For most AAU seller countries energy efficiency and renewables in buildings were major priority areas for GIS.
  - The building sector and most other sectors that countries have chosen for GIS could not be addressed by JI due to various reasons such as a large number of small entities, lack of relevant approval procedures, high prices for Project Design Documents, determination, verification, etc.
  - A programmatic approach is supported by most of the selling countries such as the Czech Republic, Hungary, Latvia, Estonia and Bulgaria while simplifying the provisions that such approaches are required to meet under the CDM and JI.
- Although some host countries in theory allow both hard and soft greening, in practice they mostly focus on hard greening, as most buyers accepted only hard greened AAUs.
- AAU/technology swaps have become a major option over the last two years: providing technologies for AAUs purchases requires far less follow up activities than monitoring the implementation of complex GIS schemes and offers the opportunity to energy the seller country’s market.

Some 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 additionality under GIS as under JI and CDM. At the current very low AAU prices it can be doubted that entire GIS programmes are additional as in some cases GIS revenues may cover only a small fraction of the investment costs. Most countries with GIS frameworks have proposed in theory credible mechanisms to implement, monitor and verify emission reductions and AAU revenue flows, using for example, independent audits. In practice in some of the assessed countries problems occurred regarding the proper implementation of GIS programmes and revenue spending, even if seller countries emphasize sound GIS implementation. Problems were also observed in the institutional framework, such as management changes in governments or funds, leading to delayed implementation of projects.

The report shows that the choice of a buyer country, in particular in the more recent deals, often also included factors such as the interest in strengthening economic relations to the host countries and governments and paving the way for technology exports. Technology swaps became a major option under GIS offering the buyer countries to enter new markets and preventing complex follow up activities. Japanese companies for examples provided electric cars to Ukraine and or Estonia as part of GIS deals. In general, GIS is seen by buyer countries as much better suited to export technologies as compared to the other Kyoto mechanisms and the GIS programmes the buyers invest in are often tailored to include the buyers companies or technologies. The differentiation between hard and soft greening turned out not to be obvious and the approaches to calculate emission reductions are far from uniform. In the first years of GIS, activities where dominated by easy to calculate emission reductions directly caused by the GIS measures. Over time, activities aimed at more indirect and long-term effects. Thus also the calculation of the greening ratio became more difficult, if not questionable. Indeed, the greening ratio was of high importance for buyer countries only in the initial years of GIS. In the last deals in 2012-2013, at very low AAU prices, the greening ratio was not an important

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1 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.
criterion anymore and strongly decreased, in particular if only direct and easy to calculate emission reductions were taken into account. Other less quantifiable criteria such as the replicability of measures or early implementation of low carbon technologies with high long-term reduction potential were mentioned by buyers as justification for small amounts of emissions directly reduced. These experiences show that there is a continuum between AAU trades with significant emissions reductions and deals with marginal direct reductions while the absence of an official definition of greening makes it difficult to draw a clear boundary between greening and hot air.

In several seller countries with mature GIS schemes, such as the Czech Republic or Estonia, GIS enabled the early implementation of emission reduction measures such as thermal insulation for buildings or introduction of low carbon technologies (eg in the area of renewables or transportation) that will be important for them to meet their 2020 emissions and renewable energy targets. In addition, in these countries GIS contributed to the creation of public awareness and know-how and the set-up of institutional structures that could be the basis for continuing such programmes with other sources of funding. Such sources may include revenues from auctioning EUAs or income from statistical transfer of renewable shares under the cooperation mechanisms of the EU renewable energy directive.

Looking ahead, experiences gained from current GIS schemes, particularly simplified MRV rules and experiences with the introduction of alternative additionality criteria may prove helpful in conjunction with the development of fund-based support mechanism for developing countries after 2012, or for post-2012 GIS within the EU effort sharing regime. GIS has provided insights into how to tackle a range of reduction opportunities not easily addressed by other market based mechanisms, such JI or 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. The experiences with GIS also showed that a market without international oversight and a lack of transparency may promote least cost options regardless of their environmental integrity. Even if the AAU market will not continue to be part of future international agreements, proper integration of these lessons can contribute to strengthening the carbon market and could be used for other international fund based approaches, like NAMAs in developing countries.
Box 1: Types of greening

There are two types of “greening” depending on the nature of the greening activities (Blyth and Baron, 2003; Andrei et al., 2006; Tangen et al., 2002).

Hard greening refers to activities in which the greening process directly delivers measurable and quantifiable emission reductions. Typical hard greening activities include investments in emission reduction technologies, e.g. in projects in the fields of renewable energy and retrofitting of buildings.

Soft greening occurs if the corresponding activities have non-quantifiable and non-measurable emission reductions. Other measures not resulting in emission reductions, such as more general environmental measures, also fall into the soft greening category. 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.

1. Introduction

This paper builds upon and updates the study “Green Investment Schemes: First experiences and lessons learned” (Tuerk et al. 2010). It is the first and – so far – only attempt to synthesise information about governmental emission rights (Assigned Amount Units, AAUs) over the period 2008 to 2012, to assess concluded AAU deals and prices in the Kyoto commitment period and to discuss underlying greening activities as well as buyer and sellers strategies.

Chapter 2 of this paper examines market dynamics, AAU supply and demand. Chapter 3 provides insights into implemented GIS schemes, and discusses the role of GIS as a carbon finance instrument in CEE countries. Chapter 4 describes key buyers and their strategies. Chapter 5 briefly analyses to what extent GIS could serve as a model for new fund based mechanisms in developing countries (eg. Nationally Appropriate Mitigation Action, NAMAs). Chapter 6 concludes by giving a synthesis of GIS developments and explores whether GIS can be seen as a success.

1.1. Green Investment Schemes as a concept

The former centrally planned economies, i.e. Central and Eastern-European (CEE) countries, plus Russia and Ukraine, have surplus of governmental emission rights (AAUs) of about 12.6 billion (Point Carbon, 2012) during the first commitment period of the Kyoto Protocol (from 2008 till 2012). 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 down 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.

AAUs were also issued for JI early crediting, i.e. emission reductions achieved under JI before 2008.

All potential buyer countries have expressed their intention not to achieve compliance through buying “hot air”, i.e. by purchasing surplus AAUs that are not related to specific greenhouse gas emission reduction activities (Gorina, 2006). The basic principle of Green Investment Schemes (GIS) is to invest the revenues from AAU sales into “greening” activities in a manner that is acceptable for both, the selling and buying governments. There are no official definitions or standards on how to “green” hot air.

Although some host countries allow both, hard and soft greening (see box above), in practice they focus on hard greening, as most buyers so far accepted only hard greened AAUs.
2. The AAU market

This chapter gives an overview of deals concluded since 2008 and discusses supply and demand. Details of the deals going beyond the traded volumes can be found in chapter 3.

2.1. Prices and deals

The AAU market is not transparent. Contracts are not available to the public and players generally only give indicative information about prices. While greened AAUs were assumed to be traded at about 14 Euro per tonne in 2008, the price decreased to about 10 Euro per tonne in 2009 and fell below 10 Euro per tonne in 2010. The price was only at 2-5 Euro per tonne in June 2012 and was assumed to be around 1-2 Euro or even lower in December 2012. Figure 1. below shows how the price of AAUs decreased over time.

![Price trend](image)

The traded volumes have been communicated for most deals and greening activities are made public by most countries. Some deals remain uncertain as they have been announced but never reported as concluded. Figure 1 displays the prices for AAUs related to GIS schemes, however there have been always cheap AAUs on the market from JI early crediting. Under the so called Activities Implemented Jointly (AIJ) emission reductions were achieved before the JI crediting period started (2008-2012) and were rewarded by AAU sales. The lowest price was observed at the Bratislava Commodity Exchange that offered in September 2013 4.3 million AAUs for only 0.03 Cents per AAU. According to the exchange the AAUs originated from GIS schemes, but also form JI early crediting. The Bratislava Commodity Exchange emphasised that AAUs from JI early crediting are more credible regarding emissions reduced than AAUs from GIS as the emissions have been already reduced in the past (pers. Communication 1, 2013). The activities of private firms in the AAU market are particularly difficult to assess as private companies who purchased AAUs have not always revealed their final buyers. Thus it remains unclear where these credits ended up 2. Such flows remain obscure as the public information from the registries is not sufficient to follow the transactions in detail.

In 2012, over 150 million AAUs were traded, a record in the AAU market’s history. The boost in volumes and drastic decline of price came in 2012 as a result of the lack of clarity on the future of the Kyoto Protocol and thus the possibility to bank AAUs resulting in large sales at very low prices. In addition the swapping of already purchased carbon credits (CERs, ERUs) to AAUs also boosted AAU purchases (Point Carbon, 2013). As trading of AAUs is possible until 2015 a few additional AAU deals can be expected. Most Annex-I countries however have purchased sufficient credits to meet their Kyoto targets. The table in Annex 1 shows all deals reported as concluded in the first Kyoto commitment period, between 2008-2012.

![Figure 2.](image)

Figure 2. and Figure 3. show seller and buyer countries in the market and their AAUs exchanged. An overview of the supply and demand is also given in the next section. Figure 2. shows that the Czech Republic, Hungary and Ukraine were early movers. The Czech Republic could continuously increase its volumes sold, while Ukraine and Hungary were not able to sell additional AAUs after 2009. Estonia started only in 2010 but could conclude a large number of deals selling significant volumes. Poland and Bulgaria entered the AAU market recently, with Poland selling huge amounts.

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2 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).
Figure 2. Trades Volumes – sellers

Figure 3. Trades Volumes – buyers

Note: the World Bank purchases were made for the Spanish Carbon Fund, the Carbon Fund for Europe and the Italian Carbon Fund.
2.2. Supply and demand

The table below shows the volume and numbers of deals under IET/GIS and under JI as well as some of deals last columns shows the amounts still available after the Kyoto compliance period.

Countries had plans to offer on the market roughly 1.5 billion green AAUs but were confronted with a lack of demand. Most buyer countries have completed their purchase programmes, with only a few possible purchases to be expected. The AAU amounts in the table above that countries would offer to sell is far below the total AAU surplus of CEE countries which is estimated to be 12.6 billion (Point Carbon 2012) and doesn’t take into account the commitment period reserves, e.g. for JI and countries’ own compliance. Russia for example has a total AAUs surplus of 5873.1 million AAUs and Ukraine of 2593.5 million (Point Carbon 20012).

Experiences from Joint Implementation and IET/GIS have shown that the extent to which a nation makes use of a mechanism depends on a number of factors such as the physical project potential, institutional capacities, legal constraints, UN eligibility criteria for trading, and reputation. When comparing the number and volumes of JI projects and IET/GIS-deals carried out by a country it is obvious that a nation that is successful in IET/GIS is not necessarily successful in using JI and vice-versa.

Table 1: AAU sold over the period 2008-2012 (MtCO2eq)

<table>
<thead>
<tr>
<th>Country</th>
<th>AAUs sold 2008-2012 (Mio)</th>
<th>Number of deals</th>
<th>AAUs available for GIS end of 2012 (Mio)</th>
<th>Number of registered projects</th>
<th>Volume of ERUs issued as of July 2013 (MtCO2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>7</td>
<td>2</td>
<td>193</td>
<td>30</td>
<td>2.6</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>102.4</td>
<td>13</td>
<td>47.6</td>
<td>58</td>
<td>0.6</td>
</tr>
<tr>
<td>Estonia*</td>
<td>74.5</td>
<td>18</td>
<td>16</td>
<td>12</td>
<td>0.5</td>
</tr>
<tr>
<td>Hungary</td>
<td>13</td>
<td>4</td>
<td>37</td>
<td>11</td>
<td>1.3</td>
</tr>
<tr>
<td>Latvia</td>
<td>28.7</td>
<td>7</td>
<td>11.3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Lithuania</td>
<td>30</td>
<td>1</td>
<td>50</td>
<td>18</td>
<td>8.5</td>
</tr>
<tr>
<td>Poland</td>
<td>138.2</td>
<td>7</td>
<td>362.1</td>
<td>36</td>
<td>10.5</td>
</tr>
<tr>
<td>Romania</td>
<td>0</td>
<td>0</td>
<td>200</td>
<td>18</td>
<td>8.9</td>
</tr>
<tr>
<td>Russia</td>
<td>0</td>
<td>0</td>
<td>200</td>
<td>97</td>
<td>264</td>
</tr>
<tr>
<td>Slovakia</td>
<td>15 (50)*</td>
<td>3</td>
<td>77(42)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ukraine</td>
<td>47</td>
<td>3</td>
<td>353</td>
<td>271</td>
<td>458</td>
</tr>
<tr>
<td>Total</td>
<td>458.5</td>
<td>58</td>
<td>1547</td>
<td>380</td>
<td>219.3</td>
</tr>
</tbody>
</table>

* 50 million AAUs were contracted by Slovakia but only 15 have been reported transferred

Note: The amount of AAUs available for GIS is based on what countries planned to reserve for GIS, the actual AAU surplus is in some cases (e.g. Russia) far higher.
Box 2: Eligibility to trade AAUs and ERUs

According to the UN Decision 11/CMP.1\(^1\) to participate in the mechanisms, Annex I Parties must meet, among others, the following eligibility requirements:

- have ratified the Kyoto Protocol.
- have calculated their assigned amount in terms of tonnes of CO₂-equivalent emissions.
- have in place a national system for estimating emissions and removals of greenhouse gases within their territory.
- have in place a national registry to record and track the creation and movement of ERUs, CERs, AAUs and RMUs and must annually report such information to the secretariat.
- they must annually report information on emissions and removals to the secretariat.

In case a host Party doesn’t meet all of the eligibility requirements it can be suspended from AAU trading. In case of JI if a host Party meets all of the eligibility requirements to transfer and/or acquire ERUs, the host Party itself may issue the appropriate quantity of ERUs. (“Track 1” procedure.). If a host Party does not meet all, verification of emission reductions or enhancements of removals as being additional has to be done through the verification procedure under the Joint Implementation Supervisory Committee (JISC). (“Track 2” procedure).

In the past the traded AAU amounts were generally limited by the buyer’s aim to purchase credibly green AAUs and sellers needed to address the demand for greened AAUs. However, recently sellers were able to sell also large amounts at low prices and obviously could satisfy buyers’ expectations on greening.

2.2.1 The supply side

This section discusses several issues that influenced the supply of green AAUs. These include the role of banking AAUs into the next Kyoto commitment period; and possible limitations of the capacity of host countries to offer credibly greened AAUs.

The role of banking AAUs for AAU supply

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 the amount of AAUs to offer until end of 2012. There was no decision on banking AAUs neither EU internally nor internationally up to the UN Climate Conference in Doha late 2012. This uncertainty tempted seller countries to sell large volumes even at very low prices throughout 2012 assuming these may have no value anymore after 2012.

2.2.2 The demand side

Most buyer countries, including Austria and Belgium, purchased AAUs exclusively from countries with a clear and transparent GIS. The largest buyers, however – Japan (the government as well as private companies) and Spain – concluded deals also in countries, where there was lack of clarity regarding important elements of a credible GIS, such as the additionality of emission reduction measures.

\(^1\) see http://unfccc.int/files/kyoto_protocol/compliance/enforcement_branch/application/pdf/eligibility_list_20121215_forPosting.pdf

Currently trying to establish a sufficiently credible GIS in order to re-attract buyers. Ukraine, even though it has the second largest potential amount of AAUs to offer has only concluded three deals in the first years of GIS but has by far the highest number of registered JI projects. The absence of a clearly defined greening scheme and the political situation hindered Ukraine from concluding additional deals. Furthermore, Ukraine was suspended from AAUs trading by the UN in 2011 for violating Kyoto Protocol emissions reporting rules.

Also Romania and Lithuania were suspended from trade in 2011. Ukraine, Romania and Lithuania regained eligibility in 2012. Bulgaria that started working on its GIS far earlier than most of the other countries was suspended temporarily in 2010 for a half year, but finally able to contract the first deals in 2012, while it could implement 30 JI projects. While Romania didn’t sell any AAUs it implement 18 JI projects. Poland was a latecomer but emerged as the major seller in terms of volumes in 2012. Russia, even though holding the largest AAU surplus, did so far not participate in IET and has started approving JI projects comparably late due to institutional (Tuerk et al., 2010) and presumably legal constraints but approved a high number of projects in a short timeframe.
Limits of green AAUs?

In our previous report (Tuerk et al 2010) we argued that below the price range of €5-10 no credible greening will occur, and thus the price would not fall below this range. Regarding the supply of green AAUs our assumption was that the financing and implementation capacity of the AAU seller countries may limit the supply. In most cases, the proceeds from AAU sales so far covered only a part of the investment costs of the greening activities. The remainder had to be financed either through capital markets, state subsidies, or by the beneficiaries themselves. Raising such co-funding has proven to be difficult, in particular in the economic crisis. In addition, it has been a challenge for most seller countries to implement many greening activities. In 2012 however, large amounts of AAUs at very low prices were sold that were still called ‘green’ as the greening ratio seems to have lost importance for some of the buyers.

At low prices, however, a high greening ratio (i.e. emissions saved per amount of AAUs sold, at maximum 1:1) is unlikely even though all revenues may be invested in greening activities. Apparently, either the AAU revenues cover only a small part of the investments or the AAU revues are used to finance low carbon technologies, such as electric cars provided by the buyer country, with limited or unclear greenhouse gas reductions. Where AAU revenues cover only a small part of the investments, e.g. as a topping-up of existing programmes, this contradicts the strategy of some seller countries to create specific GIS-programmes easily separable from other activities, being additional and may thus reduce transparency. In some cases, however, buyers argue that actions that have limited immediate GHG mitigation potential, such as efficient lightning may be highly replicable and would ultimately lead to long-term emissions reductions. In other cases soft greening measures are being considered where reductions can’t be quantified. In any case a high greening ratio, in the past claimed by some buyers, seems to have lost importance and thus the market saw deals with low prices, high volumes of AAUs sold but only small amounts of greenhouse gas reductions foreseen. These experiences show that there is a continuum between greened AAUs with significant emissions reductions and “hot air” while the absence of an official definition of greening makes it difficult to draw a clear boundary.

Box 3: The Doha decisions on AAU banking

At the UNFCCC climate conference in Doha at the end of 2012, Parties decided how to deal with the large surplus of Assigned Amount Units (AAUs) from the first Kyoto commitment period (2008-2012: CP1). Kyoto Protocol rules allow countries to carry over all unused AAUs into the next commitment period (CP2). The compromise adopted in Doha has two main elements relating to surpluses from the first and second commitment period¹. The decision does not limit the carry-over of surplus AAUs from CP1 but puts limits on their use in the next commitment period. It also makes it impossible for countries without a reduction target in CP2 to sell their surplus to countries with a reduction target. To underline their climate commitments, several countries made political declarations that they will not buy AAU surplus from CP1 in CP2

The greening ratio describes the relation between the amount of AAUs sold to the emission reduction achieved. This means, if activities funded with the revenues of 5 million AAUs lead to an emission reduction of 5 million tons CO2eq, the greening ratio is 1, or “1:1”. The greening ratio strongly depends on the period over which emission reductions are measured or calculated. For example, an energy efficiency activity completed in 2011 would reduce only very little CO2eq during the first commitment period, i.e. until 2012. If, however, the calculation of the greening period was based on a time period of 15 or 20 years, as used by some countries, the greening ratio is much higher.

Box 4: The greening ratio
3. AAU seller countries and their GIS

This chapter gives an overview of GIS schemes in CEE countries – sellers of AAUs, based on interviews with country representatives and relevant official documentation.

3.1. Bulgaria

Bulgaria has an emission reduction target of 8% under the Kyoto Protocol, with the base year 1990 (UNFCCC, 1997). The AAU surplus in Bulgaria is expected to be up to 220 million (Government of Bulgaria, 2011). In 2010 the Bulgarian government said it intends to sell as much as possible of its AAU surplus (Personal communication 2, 2010), in 2012 it had no clear selling target but the total amount of AAUs to be sold would depend on the market conditions (personal communication 3, 2012).

GIS developments

Bulgaria started working on its GIS in 2005, far earlier than most of the other countries in the region4. The first two deals however were made late, with Austria in December 2011 and June 2012. Bulgaria sold in total 7 million AAUs to Austria (KPC, 2012).

Managing AAU sales and revenues

The management of the GIS is with the National Trust Eco Fund (NTEF). AAU Purchase Agreements (AAUPAs) signed between the NTEF and the project investors include criteria for project eligibility and requirements for project funding. 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 utilisation 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 with 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).

4 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)

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 organisations, including those accredited by the UNFCCC. Project executors and the NTEF bodies have to enable access to the data required by the accredited organisations. 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 evaluation and implementation reports of the projects are publicly available (Government of Bulgaria, 2010). For the energy efficiency of buildings projects, CO2 reductions are measured by means of audit of the technical documentation for the energy efficiency of the buildings before and after the reconstructions.

Priority areas for GIS investment

The funds generated from the sale of AAUs are to be utilised for financing projects in the energy, transport, agriculture and forestry sectors, waste management, water management, and industry.

For the first AAU deal with Austria biomass and biogas projects were realised. For the second deal some of the revenue was earmarked for emissions reductions in the private sector for producing renewable electricity and heat as well as promoting energy efficiency. The money was tendered in late 2012 and projects were selected based on their CO2 reductions (NTEF, 2012). A precondition for companies to submit a bid was substantial Austrian business participation (WKO, 20125).

3.2. Czech Republic

The Czech Republic has an 8% reduction target under the Kyoto Protocol, with the base year 1990. The country has an AAU allocation of 831 million under the Kyoto Protocol, out of which 754 million are used for the commitment period reserve (UNFCCC, 2010). The current surplus is estimated to be around 150 million AAUs which the government has allocated to GIS (personal communication 4, http://portal.wko.at/wk/format_detail.wk?angid=1&stid=681042&dstd=652

5
2012). 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) who is purchasing on behalf of the Japanese government. Many deals followed in the years 2010 and 2011 most of them with Japanese private buyers. In total up to 104 million AAUs have been sold. The Ministry of Environment (MoE) indicated that they could sell additional 26 million AAUs but this will not be very likely unless the prices slightly increases again (personal communication 5, 2013).

Managing AAU sales and revenues

The Ministry of Environment 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 (MoE) 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 under the MoE, not entering the state budget.

Another important element of the GIS management structure consists of five large banks that have numerous branches in the Czech Republic. They are involved in the scheme for administrative purposes and, if possible, for providing co-funding (there are several hundred subsidies of these banks involved in the GIS). In deals before 2012 the revenues of the AAU sales had to be spent by 2012. For deals in 2012 the sales have to be spent by the end of 2013 (personal communication 4, 2012).

Monitoring and verification

In addition to the Programme Managing Authority, there is a Monitoring Committee consisting of representatives of involved Ministries, the SEF, the Parliament, the Senate, and NGO-representatives. The Monitoring 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 are carried out by international auditors. At least 5% of the projects are checked on-site. By the end of 2012 a total of 5159 on-site inspections were carried out (5% of the overall number of approved projects).

Annual reports for 2009 and 2010 have been published; the validation showed that in only a few cases irregularities were found (personal communication 4, 2012).

Priority areas for GIS investment

The Czech Republic’s priority area for GIS is the buildings sector. The AAU revenues have so far been invested in pre-defined programmes (up to now in the Green Savings programme). In case the Czech Republic sells additional AAUs it will continue with this program, changing some parameters. 5% of the AAU revenues are used for administrative purposes, 95% cover the projects and programme. The Czech GIS is opting 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, but the acceptance of new applications was stopped in October 2010 due to a high number of applications (in total around 80 thousands applications) (personal communication 4, 2012). In the meantime the programme was prolonged to the end of 2013 (from new possible deals or from national funds). Beneficiaries include owners of family houses and apartment buildings. 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). This includes the
  - replacement of environment unfriendly heating for low-emission biomass-fired sources and efficient heat pumps
  - installation of low-emission biomass-fired sources and efficient heat pumps in new buildings
  - installation of solar-thermal collectors

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 finalised. Projects must be

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6 The auditing firm Deloitte Advisory s.r.o. audits the investments and appropriation of the total contract price; verification is done by Det Norske Veritas and The Energy Efficiency Center SEVEn (Fiala, 2010).
completed within 18 months and have to be finalised before the scheme is closed. Theoretically, 100% of the investment costs can be covered by GIS funds. However the average subsidy so far was about 60-65% of the eligible costs (personal communication 4, 2012).

In the beginning of 2013 the total number of applications, by which the successful administration is expected, was 74,777. The total expected subsidy is 20,36 billion CZK (~800 Million Euros).

- Investment subsidy: 19,0 billion CZK (~750 Million Euros)
- Subsidy for project preparation: 1,25 billion CZK (~50 Million Euros)
- Subsidy bonus: 112 million CZK (~4,3 Million Euros) (personal communication 5, 2013)

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 is provided for a 30% reduction and an even higher support is provided if a 40% reduction is achieved subject to a limitation of the annual energy need for space heating to 70 kWh/m².\(^7\) Regarding use of renewable energy sources for heating and hot water supply around 8500 biomass fired sources, around 5000 heat pumps and almost 13000 solar water heating systems (less than 6000 with additional heating) were funded (personal communication 5, 2013).

3.3. Estonia

Estonia has an 8% reduction target under the Kyoto Protocol, with 1990 as base year (UNFCCC, 1997).

GIS developments

The surplus AAUs total about 91,5 million, out of which 74,5 million have already been sold in 23 transactions with European countries and Japanese corporations during 2010-2013.

GIS activities that have been defined by the government often include concrete pre-defined programmes. They include a wide selection of hard greening programs.

There are several types of GIS projects in Estonia:

- Newly set up GIS programmes
- Enlargement of existing EU structural funds:

AAU proceeds may be used to expand existing EU structural funds programmes\(^8\), as the demand for funding for environmental protection projects exceeds what is currently available from EU sources or from the state.

- Asset swaps (environmentally friendly technology for AAUs): This option is possible only if the final owner is the state and if the exchange is necessary for a public purpose and is in the interests of the state (e.g. the electric car programme)

Managing AAU sales and revenues

The Estonian Ministry of the Environment is responsible for the management of the Green Investment Scheme and also 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. GIS projects are implemented by the relevant Ministries or their subordinate institutions.

A separate account is opened in the Treasury for each GIS programme. An account statement can be ordered by the AAU buyer at any time, showing all the incoming and outgoing transactions (personal communication 6, 2012). Detailed greening plans are part of the AAUPAs.

Monitoring and verification

For the expansion of existing measures in EU structural fund programmes the use of revenues from AAU sales are subject 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 regulations regulate the use of revenues from AAU sales if channelled into the existing EU structural fund measures (Government of Estonia, 2010).

The institutional setup and methodology for monitoring and verification is programme as well as client specific and involves existing, well-established institutions, such as the Environmental Investment Center and KredEx. The Ministry of Environment on behalf of the implementing agency is responsible for

\(^7\) Note: First, the scheme provided both, a fixed amount and a percentage of investment costs, but later the percentage element was abandoned

\(^8\) 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.
reporting to the GIS purchaser. The reporting includes semi-annual reports, annual reports, a final report after the end of the monitoring period and possible post-implementation-period reports. Financial and greening audits of the annual and final reports are undertaken by internationally recognised auditors. Estonia authorised the auditors to have full access to all relevant data, information, documents and invoices that are relevant to the disbursement of the GIS proceeds.

**Priority areas for GIS investment**

AAU revenues are used exclusively for hard greening projects. Buyers can choose their preferred greening programmes/projects. Estonia has included a financial additionality criterion in its scheme. Thus 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 anytime within the first commitment period. Priority areas for GIS include energy efficiency in residential and public sector buildings, the improvement of district heating networks, boiler house rehabilitation, expansion of renewable electricity use and public transport projects. At the launch of the GIS in Estonia the government developed a detailed catalogue of planned projects and programmes. This catalogue included 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 greening ratio for these projects was estimated to be between 2 and 0.5 (see Tuerk et al 2010).

### 3.4. Hungary

Hungary has a 6% reduction target under the Kyoto Protocol, with the average of 1985-87 as baseline emission level (UNFCCC, 1997). 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 its GIS. However, it suffered reputational problems due to intransparency of revenue spending and additionality concerns. 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).

**GIS developments**

The proceeds had not been disbursed for a longer period. 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). Therefore, other potential purchase agreements, for example with Japan, were postponed or not concluded (Point Carbon, 2009k). Since then the first disbursements have been made under the two GIS programs implemented in 2009. Since 2009, several other GIS Programs had been successfully launched.

Hungary didn’t sell any AAUs since 2010. Reasons include, amongst others, low staff capacity in the responsible ministry department, low achievable prices and the overall unstable and unreliable political situation in Hungary that made additional purchases unattractive for buyers.

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**Figure 4. Institutional setup of the Hungarian GIS since 2011**

- Minister of National Development
- Minister of State for Climate and Energy Affairs
- Deputy State Secretary for Development of Green Economy and Climate Policy
- Department of Green Economy
- Department of Climate Policy
- Energy Efficiency Programs Unit
- Emission Reduction Unit
- Energy Centre
- Tactical programming
- Strategic contribution
- Application handling
- Final decision
Currently there are approved but not yet disbursed projects of about 10 billion HUF (EUR 35.5 million) in the Hungarian GIS.

Managing AAU sales and revenues

Until 2010, the Minister of Environment and Water was primarily responsible for the management of the AAU surplus and decided on the sale of AAUs (with the agreement of the Minister of Finance). The revenues from the sales of AAUs entered a special account and did not stay in the state budget. Since 2010, the Minister for National Development is responsible for climate policy and the management of AAUs, due to governmental change (see Figure 4.). Within the framework of the Ministry, the Department for Climate Policy is responsible for the sales of the AAUs and the Department of Green Economy Development for planning and organising the various GIS Programs.

Hungary has created a special regulatory framework for the implementation of GIS. The framework is based on Act LX of 2007 and Government Decree 323/2007 (XII. 11.), which contain the particular rules on the implementation of the GIS.

The basic rules of implementation of Green Investment Scheme Programs are that (1) funding can only be provided for measures that are quantifiable and most effective in reducing the emission of greenhouse gases, and (2) the revenue, originating from the sale of units, can only be used for climate protection purposes by implementing projects with direct CO$_2$ reduction effects. These basic principles guarantee that all income from selling AAUs can only be invested into measures with direct and quantifiable reduction of greenhouse gas emissions.

Besides the environmental benefits of the reduction of CO$_2$ emissions and fostering the use of renewable energy sources, the GIS programs also aim to help green economic development and to benefit the related industries and economic sectors by creating new job opportunities.

No more than 5% of the GIS revenues can be used for administrative costs as stated in the governmental decree.

According to a new modification of November 2012 half of the revenues from the sales of AAUs – about 18 billion HUF (EUR 64 million) - enter the state budget. The other half, after deducting the contributions to developing countries – about 0.5 billion HUF (EUR 1.8 million) – need to be spent on energy efficiency measures through the GIS.

According to the GIS legislation, the GIS program 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 CO$_2$eq emission reductions. Financial and legal additionality provisions provide that the projects cannot be realised without GIS support and are not prescribed by any act or legal instrument in force. Soft greening is excluded from the greening options in Hungary. 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 on-going concern that GIS funds in Hungary may be used to finance programs for which the state support has been reduced and thus compensate budgetary problems.

Monitoring and verification

Reports on the implemented GIS projects and programs include a monthly as well as an annual audit report, prepared by an independent auditor and the Department for Green Economy Development of the Ministry for National Development. The annual report summarises the achievements of the GIS programs of a one year period, quantifies the amount of greenhouse gas emission reduction effects of the programs and collects experience regarding implementation. It also makes recommendations for possible future developments. At the finalisation of all GIS programs, a final report of each GIS program is produced, which includes all the data of the realised emission reductions of the entire program. This report is made public under the conditions defined by privacy decrees of the Hungarian Government and the Sales Contracts.

Priority areas for GIS investment

The priorities for GIS investments in Hungary are (Government of Hungary, 2010, National Renewable Energy Action plan$^9$):

- increasing the energy efficiency of buildings,

$^9$ National Renewable Energy Action Program 2010-2020. The document also declares Hungary’s commitment that the proportion of RES will be 14.65% of the total energy consumption of Hungary until 2020.
• increasing the use of renewable energy,
• increasing the effectiveness of district heating systems,
• promoting the construction of low energy use buildings,
• modernization 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.

Energy efficiency in the building sector is the main priority for spending AAU revenues in Hungary given that around 30 % of the total Hungarian greenhouse gas emissions are related to buildings (Government of Hungary, 2010, National Strategy for Energy Efficiency 2012).

In 2009 two GIS programs in the building sector were launched:

• the GIS Climate Friendly Home Panel Sub-program and the
• GIS Climate Friendly Home Energy Efficiency Sub-program, supporting energy efficiency reconstructions and the use of renewable energy sources in buildings.

For both programs, 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-program 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+.

For the Panel Sub-program, more than 1,500 applications were submitted by owners of condominiums, housing associations and municipalities, each application covering more than 30,000 flats. The development of further GIS programs had started in 2010. These target, among others, energy efficiency in public transport, lighting, and household appliances. Besides the previous programs, a complex GIS program for the replacement of old, energy consuming household machines to more energy efficient ones and a program for renewing conventional illuminators to energy efficient ones had been launched in 2010. In the same year, the Panel Subprogram had been revised and re-launched, entitled „Our home“ refurbishment and new home construction program. A GIS program for the energy efficient reconstruction of heating systems by installing solar panels had been implemented in 2011, supporting the use of renewable energy sources. The solar thermal sub programme allowed private persons and associations of home-owners with up to twelve flats to apply for...

**Figure 5. The performance of Hungarian GIS programs**

<table>
<thead>
<tr>
<th>Emission cost (EUR/tCO2)</th>
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<tr>
<td>70</td>
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<tr>
<td>60</td>
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<td>50</td>
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<td>10</td>
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<table>
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<tr>
<th>CO2 saving (t/year)</th>
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<tr>
<td>50 000</td>
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<td>40 000</td>
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<td>20 000</td>
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<td>10 000</td>
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</table>

**Legend**

- Energy efficient home appliances
- Climate friendly homes
- Block houses - Phase 1
- Block houses - Phase 2
- Our home
- Light bulbs
- ?

**Number of applications**

- 100
- 400
- 1000

*Source: Szepesi, 2013*
incentives amounting to 50% of the costs needed to acquire and install a solar water heating system. In 2012, a program for the reconstruction of heating systems with the use of renewable energy sources had been launched. These new programs are in the Monitoring Phase and the individual projects are getting reimbursed simultaneously as the projects are ending. Recently a new window of GIS was announced, which aids transport companies to buy LNG buses substituting diesel fuelled ones.

According to the analysis by Szepesi (2013) interventions with the lowest administrative burden, lowest costs of emission reductions and with the biggest annual GHG mitigation were Block houses phase 2, Our home and Light bulbs. Szepesi highlights the economies of scale under GIS in contrast to the project based mechanisms.

**Selling Removal Units**

In 2011, Hungary was able to sell Removal Units (RMUs) at a higher price than what would have been possible for AAU deals. Removal Units can be issued by parties on the basis of land use, land-use change and forestry (LULUCF) activities, can be traded among parties and represent the same compliance value as other Kyoto credits. The first RMUs were issued in 2011, in France, Australia, Russia, and Hungary.

Hungary’s forests cover around a fifth of the country after its forested area grew 13% to 19,217 km$^2$ between 1990 and 2011 (Hungarian Central Statistical Office, 2011). As a result, Hungary issued the first RMUs in 2011 for afforestation (Kyoto Protocol Article 3.3) and reforestation (Kyoto Protocol Article 3.4) activities after the UN finalised the country’s 2008 greenhouse gas emissions data in the previous year. In October 2011, the National Development Ministry of Hungary announced it had issued 3.9 million RMUs. In consequence Hungary sold the RMUs but no details on the deal were publicly available. Hungary reinvested the revenues from the RMUs sales into GIS, although RMUs already represent emission reductions proved under the Kyoto protocol provisions.

The New Zealand registry showed the transfer of 3.9 million RMUs from overseas in 2011 according to data available on the U.N. website. Although not confirmed, if the volume shown in the New Zealand registry corresponds to the purchase of the Hungarian RMUs, average prices for the transaction were US$2.95 per RMU (US$11.5 million for 3.9 million RMUs). Data reveals that companies covered by the NZ Emissions Trading Scheme used 3.17 million RMUs to meet their obligations in 2011). As no AAUs are permitted in the NZ ETS, RMUs were the cheapest available type of credits. The numbers to be found in various country submission documents testify that participants of the New Zealand carbon market hold a further 730,000 Hungarian carbon credits on their accounts for future use.

### 3.5. Latvia

**GIS developments**

Latvia has an 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 28.7 million AAUs have been sold to Austria, the Netherlands, Spain, Japan, Portugal and a Japanese private buyer. Since 2009 however, the country didn’t sell any AAUs.

**Managing AAU sales and revenues**

Money from the sale of AAUs is transferred to an income budgetary account in the State Treasury. Disbursements are organised under the budget programme “Climate Change Financial Instrument” which is the official name of the GIS in Latvia. The Ministry of Environment is the major institution to coordinate the GIS and manages GIS funds. TheGIS operator is the Environmental Investment Fund.

**Monitoring and verification**

There are two financial reports for buyers: a tender report – after the tender is finalised, and a progress report – including information on the spending of the funds and project implementation details. In addition, international auditing by a recognised 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 quarterly. Furthermore, the Advisory Council has the task to ensure transparency for the public. Project beneficiaries have to quarterly submit reports on project implementation and they are checked by the Environmental Investment Fund. Quarterly there are also meetings of the Advisory Council with the representatives of different ministries and buyers.

**Priority areas for GIS investment**

The government stated that the country would allow both hard greening and soft greening. The proportion of soft greening however is less than 5%. Legal,
financial and technological additionality are prerequisites for project selection. The overlap with EU structural funds has to be avoided. Therefore energy efficiency measures are restricted to measures in buildings (personal communication 7, 2010). In general, achieved CO₂ reductions are monitored 5 years after project completion. Data collection is ensured by project beneficiaries whereas the correctness of their reported data is verified by the Environmental Investment Fund.

The priorities for investment include the following areas (personal communication 8, 2012):

- Increase in energy efficiency in municipal buildings
- Development of technologies reducing Greenhouse Gas Emissions
- Increase of energy performance in buildings for higher education
- Technology conversion from fossil to renewable energy sources
- Greenhouse Gas Emission reductions in municipal buildings
- Greenhouse Gas Emission reductions in manufacturing buildings
- Raising of public awareness regarding the importance and possibilities of Greenhouse Gas Emission reductions
- Low energy consumption buildings
- Use of renewable energy sources in the household sector
- Reduction of Greenhouse Gas emissions in the lighting infrastructure of public territories of municipalities
- Development of technologies reducing Greenhouse Gas Emissions and implementation of pilot projects
- Reduction of Greenhouse Gas Emissions in the transport sector – support for introduction of electrical vehicles and their charging infrastructure
- the volume of a project had to be no less than 50,000 LAT (ca 70,000 Euro) and could not exceed 2 million LAT (ca 2.8 million Euro);
- public procurement had to be a mandatory part of a project; related spending 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 are 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.

The Latvian GIS does not build on any other national support scheme, it 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).

3.6. Poland

As a Party to the Kyoto Protocol, Poland has made a commitment to reduce greenhouse gas emissions by 6% in the period 2008-2012. As a result of the transformations of the nineties, a difficult and costly restructuring of the economy (particularly of high-emission industries) and a number of environment-oriented investments – Poland has the third largest amount of surplus AAUs in the world.

GIS developments

Until January 2013 the Minister of the Environment concluded nine contracts for the sale of AAUs worth over EUR 190 million. The first contract was signed

10 1 LAT equals around 1.4 € (as of September 2013)
in November 2009 with the European Bank for Reconstruction and Development (EBRD), acting on behalf of the Spanish Government. Further contracts with Japanese companies were signed in March 2010 and April 2010, respectively. Yet another contract with the EBRD, acting on behalf of the Irish Government, was concluded in May 2010. The next contract was signed with the New Energy and Industrial Technology Development Organization (NEDO) in December 2010 on behalf of the Japanese government. In October 2011 contracts were signed with the World Bank on behalf of the Spanish Carbon Fund and the Carbon Fund for Europe. In October 2012 the Polish government signed a deal of about 80 million AAUs worth more than 40 million Euro to Spain, Poland’s largest deal of this kind so far. Poland intends to use the revenues from the deal for financing improvements in municipal transport and lighting. The last contract was signed with the World Bank in November 2012 worth over 20 Million Euro. In the last two deals the price was assumed to be on its lowest level, at about 1.2 EUR per unit.

Managing AAU sales and revenues

The Polish Government introduced the Act of 17 July 2009 on the System to Manage the Emissions of Greenhouse Gases and Other Substances, which came into force on 18 September 2009. Moreover, the Act sets a framework for selection, appraisal and monitoring of GIS co-financed projects.

In accordance with the above Act, the management of the system has been assigned to the National Fund for Environment Protection and Water Management (NFEPWM), which acts as the National Green Investment Scheme Operator. It is tasked with preparing calls for proposals and evaluation of applications for financing under the GIS, supervision of program and project implementation, including the utilization of funds by beneficiaries, appraisal of the obtained environmental effects and publicity about the national Green Investment Scheme. Furthermore, the national operator is obligated to prepare and submit reports envisaged under AAU sale contracts.

In view of the buyers’ requirement to use proceeds from the sale of AAUs to finance specified climate-protection purposes, the NFEPWM has set up a special bank account – known as the climate account, to hold all proceeds from the sale of AAUs. It is possible to use sub-accounts of the climate account for proceeds from specific contracts; this enhances the transparency of the system for buyers.

The Act also provides for the establishment of the GIS Consultative Council as the advisory body to the Minister of the Environment. The Council appraises procedures for the intake of financing applications and reviews programs and projects provisionally qualified for financing. The Council includes representatives of the Ministry of the Environment, of six other ministries (competent in matters of economy, finances, the State Treasury, agriculture, transport and science) and of the National Emission Accounting and Management Center.

Priority areas for GIS investment

Poland allows hard and soft greening measures. The priority programs currently being implemented under the GIS include:11

- Energy management in public buildings
- Agricultural biogas networks
- Biomass heat and power plants
- Construction and reconstruction of electricity networks for connecting renewable wind energy sources
- Energy-efficient street lightning
- Urban transport
  - purchase of new hybrid CNG buses
  - training drivers of urban transport vehicles on servicing low-emission fleet
  - modernisation or construction of a service station for fuelling of hybrid CNG buses
  - modernisation or construction of bicycle routes
  - modernisation or construction of bus lines
  - modernisation or construction of “Park and Ride” car parks
  - implementation of urban transport management systems

Implementation of the GIS project performance

From 2010 to 2013 the GIS Operator has published 14 calls for proposals covering all the six priorities. All the announcements and the results of competitive procedures were published online.12 Grant agreements were signed with 249 beneficiaries by the end of February 2013, representing an amount of 13:

- EUR 1 99.4 million (PLN 413 million) for energy management in public buildings and for energy

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13 GIS system greening activities National Fund for Environmental Protection and Water Management National Green Investment Scheme Operator (GiS), 2013.
management in buildings of selected public sector entities programmes

- EUR 11.9 million (PLN 49.3 million) for agricultural biogas plants programme
- EUR 2.8 million (PLN 11.5 million) for biomass combined heat and power stations programme

It is anticipated that the remaining selected projects will be completed by the end of 2013, amongst them thermo-rehabilitation of more than 200 nurseries, kindergartens, primary schools, high schools and hospitals. The GIS Operator has launched two calls for proposals since the beginning of 2013 and plans to place another one. Due to project cycle timing, completion of projects to be selected under those three calls is expected by 2016. More than 100 grant agreements are expected to be signed with beneficiaries until the end of 2013.

3.7. Ukraine

GIS developments

Ukraine holds an amount of 4,164 million AAUs for the first Kyoto commitment period. The commitment period reserve is 2,067 million AAUs (UNFCCC, 2006b). As the national reserve is 1,400 million AAUs, the amount that may be sold under a GIS in the first commitment period is around 1,000 million AAUs (State Environmental Investment Agency, 2009). In 2009 Ukraine had a target to sell 400 million AAUs. In 2011 the UN suspended Ukraine from AAU trading under the Kyoto Protocol because of a breach of reporting rules. 14

2009 saw a few transactions, 44 million AAUs were sold to the Japanese government and to a Japanese company (Point Carbon, 2009a). In December 2009, 3 million AAUs were sold to Spain (Point Carbon, 2009k). Since 2009 however no AAU sales were sold and currently no negotiations are on-going, additional transactions however may be carried out. Given the political situation in Ukraine EU countries currently are not interested in purchasing AAUs from Ukraine.

Managing AAU sales and revenues

The regulatory provisions for GIS in Ukraine were set in 2008 and in principle are still valid. The State Environmental Investment Agency (SEIA) is the main institution for both JI and GIS management and for the country’s compliance with the Kyoto Protocol. With regard to GIS, SEIA is responsible for negotiations with buyers as well as for the design of the GIS under the government’s supervision. A specific GIS law embedded in the country’s legal system was not seen as necessary; AAU sales and revenue disbursement processes operate through governmental decisions. There is no overall GIS architecture in Ukraine. Concrete greening requirements are set by the AAUPA. Specific details of greening activities and greening requirements are reached in bilateral consultations on each GIS project between Ukraine and the buyer country. Each of Ukraine’s AAUPAs provides that the disbursement of funds is due by 2012, provides for an annual reporting, periodic site-visits and regulates details on international technical and financial inspection.

Monitoring and verification

The details about financial monitoring of the deals and of future projects are included in the contracts with the buyers, which are not publicly available. Buyers are able to send their representative(s) to participate in the MRV process. In addition, project performance reports 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 9, 2012).

Priority areas for GIS investment

The GIS in Ukraine in principle allows for both hard greening and soft greening options. While there was concern a few years ago that Ukraine may not identify a sufficient number of suitable projects, since 2009, more than 1660 projects have been identified with priority in following areas:

- Energy efficiency in buildings
- Energy efficiency in the Kiev subway
- Reconstruction in public and residential buildings
- Thermal measurement equipment
- District heating
- Mining sector modernization
- Waste water treatment

The areas in which GIS revenues are being invested were also influence by Japanese AAU buyers, who aim to sell Japanese technologies. In October 2012 SEIA and Sumitomo Corporation agreed that Sumitomo delivers about 1200 Toyota Prius hybrid cars for Ukraine’s police vehicle renewal project as part of a $34 million AAU agreement in 2009 (Sumitomo, 2012). In spring 2013 the Ukrainian

government stressed that owing to successful realization of GIS projects Ukraine had significantly enlarged and deepened cooperation with Japan\textsuperscript{15}.

### 3.8. Lithuania

Lithuania has an emission reduction target of 8% under the Kyoto Protocol, with 1990 as base year (UNFCCC 1997). The total amount of AAUs is 227 million tCO\textsubscript{2}eq, with 107 million tCO\textsubscript{2}eq reserved for the commitment period (2012 UN inventory data).

**GIS developments**

The allocation of funds to GIS could total about 50-80 million tCO\textsubscript{2}eq, this is the country’s total surplus out of which 28 millions AAUs have already been sold. In April 2010 the Lithuanian government has finalized the GIS legislation and sold 30 million AAUs in 2011. In late 2011 however the UN imposed temporary restrictions for Lithuania to sell AAUs as the greenhouse gas monitoring reports didn’t meet all the defined requirements. In late 2012 the suspension was cancelled but Lithuania so far didn’t sell any additional AAUs. In the meantime however Lithuania could implement JI projects under JI track 2 that didn’t depend on the Kyoto eligibility requirements. During 2012 the tenders for most projects from the 2011 agreements were carried out, the projects have been selected and financing has been granted by the Minister of Environment. Currently most of these projects are in a preparatory phase. In the beginning of 2013, some beneficiaries have started implementing their projects. Most of the projects were modernisation (renovation) projects - renovation of individual houses and educational institutions’ buildings. For other projects where beneficiaries plan to install biomass boilers public procurements are carried out to purchase the necessary equipment. The same public procurement procedures are being undertaken by beneficiaries who shall replace the public transportation buses with environmentally-friendly buses (Personal communication 10, 2013).

**Managing AAU sales and revenues**

For the implementation of GIS projects a special Climate change program as GIS operator is responsible (see Figure 6.) that is supported by other funds, while the Ministry of Environment is the administrator of the GIS scheme.

**Monitoring and verification**

Typically, the Ministry of Environment or the institution responsible for administration of GIS projects (GIS operator) have to prepare annual progress reports that include information on the implementation of the GIS projects and disbursement of proceeds, based on the reports submitted by project beneficiaries. These reports contain the information for the preceding calendar year on the implementation of the selected GIS projects. At the end of the implementation or disbursement period the Ministry of Environment or the GIS operator have to prepare a final progress report for the buyer. This report contains the same information as an annual progress report, but in relation to the entire period of this agreement. These reports have to be audited by an internationally recognised auditor (Personal communication 10, 2013).

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\textsuperscript{15}http://www.kmu.gov.ua/control/en/publish/article?art_id=246238345&cat_id=254314975
communication 10, 2013). After implementation of the projects, beneficiaries have to calculate the reduction of greenhouse gases.

The assessment methodology for reductions of greenhouse gases is also enacted in the legislation. Reports on the reduction in greenhouse gas emissions based on the results of laboratory measurements and/or calculations must be submitted by the applicant to the GIS operator. The reports for the first year must be approved by independent evaluators. The Ministry of Environment has to prepare quarterly reports including information about disbursed and unused proceeds. This information also can be provided upon request. Some agreements authorise the buyer of AAUs to carry out the inspection of the project’s implementation by visiting actual locations. In some agreements, on request, the buyer has the right to inspect the balance of the proceeds in the account (Personal communication 10, 2013).

To meet the 2020 renewable targets Lithuania proposes in its National Renewable Action Plan statistical transfer of renewable shares to other EU countries that may have difficulties reaching their renewable targets. The revenues of the trade would enter a special national programme for the development of renewable energy sources. The implementation of such a mechanism could build upon the experiences Lithuania made with GIS.

Priority areas for GIS investment

The priority areas for GIS are energy efficiency and renewable energy in public and residential buildings (eg biomass), renovation of public buildings, and environmental friendly vehicles (hybrid buses) (Personal communication 10, 2012). The GIS in Lithuania in principle allows for both hard greening and soft greening options in which soft greening is about 4-5%. The AAU money generally covers from 50 to 100% of the project costs.

3.9. Romania

Russia’s Kyoto target is to maintain its 1990 emissions level (UNFCCC, 1997). The nation has an 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).

In Romania, the discussion on GIS has been going on for more than seven years. In 2006, the report “Developing a Green Investment Scheme in Romania” (Andrei et al., 2006) proposed a general structure 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 were planned to be brought into place until mid-2010 but have not happened since (ICIS Heren, 2010). In 2010 Romania aimed to sell 200 million AAUs (ICIS Heren, 2010), but no deal was concluded. Also the responsibilities for GIS changed between ministries. In 2011 Romania was suspended from AAU trading by the UN as it was not seen in compliance with the UN rules on greenhouse gas emissions reporting. In mid-2012 Romania became eligible again but so far didn’t sell any AAUs.

3.10. Russia

Russia initiated the idea of GIS back in 2000. However, thirteen years have passed, and the development of the Russian GIS is still stagnant. Legally important decisions have been taken in 2009, when the Russian government adopted Directive 843, dealing with JI issues. According to this Directive, the Ministry of Economic Development would be the focal point for JI activities, while the state owned Sberbank would be the “operator of carbon units”. With regard to GIS, Sberbank would be the key institution to prepare deals. So far however Russia didn’t sell any AAUs. There are several reasons why Russia was slow in developing a GIS and didn’t enter the AAU market. Apart from institutional and administrative barriers...
the revenues from AAU sales are not of high priority for the country, compared to other more lucrative business areas, such as oil and gas exports.

3.11. 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 private firm Interblue in a highly controversial deal for the (at that time) low price of reported 5.05 Euro per AAU (Point Carbon, 2009f). Japanese companies were assumed to be final buyers of these AAUs. This deal, due to the low price and a non-transparent process, has caused two successive environmental ministers losing their position and legal ways to undo the deal were explored by the government. 15 million AAUs were reported to have been transferred to the buyer (Point Carbon, 2009g).

The reputational damage Slovakia suffered due to the fact that it doesn’t have a GIS in place hindered Slovakia from selling additional AAUs. Furthermore, a report of the UN expert review team found in Slovakia several deficiencies and the Compliance Committee of the Kyoto Protocol started subsequently a compliance procedure against the Slovak Republic. There was the danger that Slovakia would lose its eligibility for emission trading. The reaction of Slovakia was the implementation of a whole set of measures, such as establishment of the Inter-Ministerial High Level Committee on Coordination of Climate Change Policy\footnote{http://www.minzp.sk/en/press-centre/press-releases/press-releases-2012/slovakia-averted-sanctions-our-right-emission-trading-remains-intact.html}. The Compliance Committee of the Kyoto Protocol at the same time decided in their favour in the proceeding whether to apply adjustment (increase) for emissions in the transport sector and thus Slovakia saved 670000 tons of AAUs. In 2012 Slovakia started again to develop a GIS and started negotiations with Austria and Spain. So far no new deals have been concluded.

4. AAU buyer countries and their strategies

Given the current significant oversupply of AAUs and the resulting buyer’s market, it is of major interest on which criteria potential buyers based their purchase decisions. Key criteria for buyers to choose a seller country included the AAU price, the presence and quality of a greening scheme and the greening ratio (emissions saved per amount of AAUs sold). In addition, some buyer countries had an interest in particular greening activities which offer opportunities for technology transfer.

The following sections provide information on GIS strategies of Japan, the Netherlands, Spain and Austria showing the broad range of reasons for the participation in the AAU market and selection criteria of seller countries.

4.1. Austria

Austria has a reduction target of 13 % based on the year 1990. Until January 2013 Austria signed 51 projects under CDM (Clean Development Mechanism), 16 under JI (Joint Implementation) and 9 contracts under GIS. The country so far purchased 24.5 million CERs, 7.6 million ERUs and 38 million AAUs. CERs, ERUs and AAUs are seen complementary. The choice between them depends amongst other criteria on the price, the project technology and the environmental integrity. So far Austria bought AAUs from Bulgaria, Czech Republic, Estonia and Latvia.

The criteria for choosing particular selling countries were:

- Development of the GIS scheme
- Reliability of the greening
- Building on existing cooperation
- Reliability of the GIS country
- Options for technology export

The potential technology exports and proven CO₂ mitigation measures were the main criteria for choosing particular projects. The Austrian JI and CDM programme also requires full hard greening. In the framework of GIS the Austrian programme cooperates with the Austrian Trade Organisation to realize opportunities for equipment/technology export to selling countries.

The principal areas in which Austria is investing are:

- Renewable energy
- Energy efficiency in private and public buildings
- Environmental support schemes

**Austrian companies in the GIS market**

According to Wohlschläger (2012) the KPC sees it is easier to achieve technology exports in GIS projects than in CDM projects. So far, the Czech market allowed Austrian companies to get involved in the implementation of GIS projects, in particular in the Czech building sector, in which Austrian companies were already involved. In one project, which consisted of about 70,000 individual measures, an Austrian business participation of 10% was achieved (Wohlschläger, 2012). The supporting “green programme”, which is managed by the Czech Ministry of Environment, includes Austrian funds and funds from other GIS partners which invested in the same programm (Wohlschläger, 2012). Also in Estonia, Austrian companies could participate in the construction of biomass-based district heating systems and in Latvia in the area of fuel switch from fossils to renewables.

**4.2. Japan**

The Japanese government and private companies so far have been the largest buyers on the AAU market. Japan’s New Energy and Industrial Technology Development Organization (NEDO) is purchasing on behalf of the Japanese government. 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 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. Japan bought AAUs from Hungary, Ukraine, Czech Republic, Estonia, Latvia, Lithuania and Poland. Reasons for the selection of a high diversity of seller countries include an interest in strengthening relations to the governments and technology exports. Another reason is the spread of risk regarding the implementation of appropriate GIS schemes in the seller countries going along with reputational risks for the Japanese government.

**Japanese companies in the GIS market**

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. There has been increasing interest by Japanese companies in purchasing AAUs and a large number of deals involving Japanese companies have been concluded. While the Japanese government definitely cared about its reputation, Japanese companies are rumoured to be involved in low-cost deals with no or only limited greening.

Figure 7 shows the large inflow of credits and in
particular in 2011 the large outflows, indicating that far more credits were purchased than needed for domestic compliance. A large amount of CERs left the country towards the UK in 2011. Market reports of swapping AAUs versus CERs cannot be finally verified.

4.3. The Netherlands

In 2009, the Netherlands bought three million AAUs from Latvia. The country currently does not intend to buy any more AAUs. The Dutch purchase target was initially to buy 100 million international credits, but then was reduced to 65 million. Currently there are no plans for further AAU purchases.

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 the AAU revenues are channelled into hard greening, i.e. in this case in energy efficiency and/or renewable energy projects (Personal communication 12, 2010).

4.4. Spain

In 2009 the government of Spain intended to purchase about 160 MtCO2eq during the first commitment period (Personal communication 12, 2009). In 2013, it had a purchase plan of 194 MtCO2e for the same period, including CERs/ERUs/AAUs (Personal communication 13, 2013). According to a governmental official in 2009, 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 were intended to fill the gap that CERs and ERUs will not cover due to delays in project registration and issuance. In the meantime however Spain purchased more than 100 million AAUs directly or via Carbon funds.

There is a list of requirements for Spain to choose the seller country, such as the investment period in the short term, cost-effective measures with broad coverage, flexible greening ratio for different project type and crediting periods, simple methodologies for monitoring and verification, thorough supervision (financial auditor and greening effect verifier), and earmarking of revenues through special budget or extra-budgetary fund (Personal communication 13, 2013).

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 the preferred option, a certain share of AAU proceeds may be channelled 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, and energy efficiency (including transport) (Personal communication 13, 2013). The Spanish Government encourages Spanish technology providers to take part in tenders organised by selling countries. According to the Spanish government, experiences with GIS have been positive in most cases. Sometimes it has been difficult to start with the GIS implementation, but in most cases funds are being spent as planned and projects are running successfully. In cases where delays on delivery were foreseen, the Spanish government extended the GIS implementation periods. In other cases, the Spanish government transfers money between programs within the same contract (Personal communication 12, 2013).

4.5. Synthesis of buyers’ strategies

The credibility of GIS schemes was a major criterion for governments in the initial years of the mechanism. Several seller countries put a lot of effort in designing credible schemes; others had difficulties in selling AAUs after loss of credibility. In the last year however the picture changed. The prices saw a race to the bottom given the uncertainty of post-2012 AAU use and trade and buyers were satisfied with greening activities having low overall emissions reduction.

Another strategy that was part of GIS deals from the beginning has gained a strong importance: the export of buyer countries’ technologies into host countries GIS programmes. For several governmental buyers the opportunities to export technologies was an important criterion when selecting GIS programmes and in some cases host countries’ tenders for projects under GIS were tailored to include
companies from the buyer country. The export of technologies includes also swapping AAUs against technologies as done by Japanese companies. The AAU buyers provided for example hybrid buses, electric or hybrid cars, and thus could enter new markets for technology exports while circumventing the complex follow up implementation and monitoring efforts of traditional GIS programs. Technology swaps were also an option when the revenues of AAU sales were low due to low prices and host countries had no co-financing options. Also arbitrage trades by companies or governments were claimed in particular in 2012 where previously purchased CERs were substituted by cheaper AAUs to be used for compliance and CERs were sold into those markets that don’t accept AAUs but CERs such as the European Emission Trading Scheme.

5. Post-2012 fund based 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 high sustainability benefits. These areas include, but are not limited to: energy efficiency in the building sector, forestry, and small- and medium-scale bioenergy. There are several reasons why the carbon market has failed in these areas. For energy efficiency 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 energy efficiency projects and the difficulty to calculate the emission reductions. In addition, there are often non-financial barriers, which hinder 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.

NAMAs as fund based mechanisms

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 being discussed as a possible voluntary action by developing countries to mitigate climate change. NAMAs could be driven by 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 in section 3 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. 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 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.

19 See article 1.b (ii) of the Bali Action Plan
Market dynamics have shown the importance of players’ reputation and mistrust regarding the implementation of greening activities was common on the side of the buyers, going along with the fear to worsen their own reputation. The more recent experiences with GIS also showed that a market without international oversight and a lack of transparency may promote least cost options regardless of their environmental integrity. Given these experiences, we conclude that international fund based approaches under NAMAs will need a very cautious approach towards implementation agreements and monitoring and evaluation in order to minimize mistrust and malfunctioning. A more homogeneous approach under, e.g. the UNFCCC, but taking into account the different capacities and capabilities of developing countries may help to reduce discrepancies between recipients and to establish standards which are not harmonized in the case of GIS.

6. Synthesis of GIS developments – Conclusions

The surplus AAUs held by CEE countries provided an additional opportunity for their participation in the carbon market. The inception of GIS opened a pathway to their participation and has resulted in an active AAU market. Around 460 million GIS-backed AAUs have been on the market, representing a value of around 1.6 billion Euro – giving an average price of Euro 3.5. This represents only a fraction of the roughly 2 billion AAUs that seller countries could offer on the market. The impact of GIS-backed AAUs on the global carbon market became significant since 2012 as large amounts of low cost AAUs were traded.

This report assessed the strengths and weaknesses of established GISs, its role as a carbon finance instrument and recent market dynamics along with seller and buyer countries’ strategies. The developments in the AAU market have shown that it is highly diverse both in terms of implementation in seller countries and with regards to priorities of buyer countries. The most successful sellers in terms of concluded deals have been Estonia and the Czech Republic – both countries have a credible GIS in place with transparent rules for monitoring and verification of emissions reductions and financial flows. In addition, none of them complements existing national subsidy programmes with the AAU funds preventing additionality concerns. Other countries had more mixed records due to weaknesses in their GIS programs. Even though Hungary was one of the “early movers” regarding the setup of a GIS and has been the first country to have concluded an AAU deal, it suffered reputational problems due to the uncertainty of revenue spending that continued up to now. Slovakia lost access to the AAU market due a controversial deal and is currently trying to establish a sufficiently credible GIS in order to attract buyers. Ukraine, even though it has the second largest potential amount of AAUs to offer, has only concluded three deals. The absence of a clearly defined investment and greening scheme and the political situation hindered Ukraine from concluding additional deals. In addition Ukraine was temporarily suspended from AAUs trading by the UN as were Romania, Bulgaria and Lithuania. Estonia joined the market late, but has taken the position of a major seller in the market. Poland finally emerged as major seller in terms of volumes in 2012.

Several design elements dominate existing GISs, the major ones are the following:

1. For most AAU seller countries energy efficiency and renewables in buildings were major priority areas for GIS. The building sector and most other sectors that countries have chosen for GIS (e.g. transport) could not be addressed by JI due to various reasons such as a large number of small entities, lack of relevant approval procedures, high prices for Project Design Documents, determination, verification, etc. A programmatic approach is supported by most of the selling countries such as the Czech Republic, Hungary, Latvia, Estonia and Bulgaria while simplifying the provisions that such approaches are required to meet under the CDM and JI20.

2. Although some host countries in theory allow both hard and soft greening, in practice they mostly focus on hard greening, as most buyers accepted only hard greened AAUs.

3. AAU/technology swaps have become a major option over the last two years: providing technologies for AAUs purchases requires far less follow up activities than monitoring the implementation of complex GIS schemes and

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20 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.
Most countries avoid overlap between GIS funds and existing national support programmes in order to guarantee additionality. However, a few countries, such as Hungary allow the use of GIS funds for existing national programmes. Some 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 additionality under GIS as under JI and CDM. At the current very low AAU prices it can be doubted that entire GIS programmes are additional as in some cases GIS revenues may cover only a small fraction of the investment costs. All of the existing GIS schemes envisage monitoring and verification of AAU revenue flows, including by international auditors. Regarding the monitoring and verification of emission reductions in contrast to JI (track 2)21 and the CDM, simplified approaches were developed. Emission reductions are calculated based on measuring energy consumption reductions, on project documentations prepared by authorised persons or on random checks of project implementation in case of programmatic projects. Most countries with GIS frameworks have proposed in theory credible mechanisms to implement, monitor and verify emission reductions and AAU revenue flows, using for example, independent audits. In practice in some of the assessed countries problems occurred regarding the proper implementation of GIS programmes and revenue spending, even if seller countries emphasize sound GIS implementation. Problems were also observed in the institutional framework, such as management changes in governments or funds, leading to delayed implementation of projects.

The report shows that the choice of a buyer country, in particular in the more recent deals, often also included factors such as the interest in strengthening economic relations to the host countries and governments and paving the way for technology exports. Technology swaps became a major option under GIS offering the buyer countries to enter new markets and preventing complex follow up activities.

Japanese companies for examples provided electric cars to Ukraine and or Estonia as part of GIS deals. In general, GIS is seen by buyer countries as much better suited to export technologies as compared to the other Kyoto mechanisms and the GIS programmes the buyers invest in are often tailored to include the buyers companies or technologies.

The differentiation between hard and soft greening turned out not to be obvious and the approaches to calculate emission reductions are far from uniform. In the first years of GIS, activities where dominated by easy to calculate emission reductions directly caused by the GIS measures. Over time, activities aimed at more indirect and long-term effects. Thus also the calculation of the greening ratio became more difficult, if not questionable. Indeed, the greening ratio was of high importance for buyer countries only in the initial years of GIS. In the last deals in 2012-2013, at very low AAU prices, the greening ratio was not an important criterion anymore and strongly decreased, in particular if only direct and easy to calculate emission reductions were taken into account. Other less quantifiable criteria such as the replicability of measures or early implementation of low carbon technologies with high long-term reduction potential were mentioned by buyers as justification for small amounts of emissions directly reduced. These experiences show that there is a continuum between AAU trades with significant emissions reductions and deals with marginal direct reductions while the absence of an official definition of greening makes it difficult to draw a clear boundary between greening and hot air.

In several seller countries with mature GIS schemes, such as the Czech Republic or Estonia, GIS enabled the early implementation of emission reduction measures such as thermal insulation for buildings or introduction of low carbon technologies (eg in the area of renewables or transportation) that will be important for them to meet their 2020 emissions and renewable energy targets. In addition, in these countries GIS contributed to the creation of public awareness and know-how and the set-up of institutional structures that could be the basis for continuing such programmes with other sources of funding. Such sources may include revenues from auctioning EUAs or income from statistical transfer of renewable shares under the cooperation mechanisms of the EU renewable energy directive.

Looking ahead, experiences gained from current GIS schemes, particularly simplified MRV rules and experiences with the introduction of alternative additionality criteria may prove helpful in conjunction with the development of fund-based support

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21Track 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.
mechanism for developing countries after 2012, or for post-2012 GIS within the EU effort sharing regime. GIS has provided insights into how to tackle a range of reduction opportunities not easily addressed by other market based mechanisms, such as JI or 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. The experiences with GIS also showed that a market without international oversight, clear standards and a lack of transparency may promote least cost options regardless of their environmental integrity.

Standards and criteria for the recognition of emission reductions would need to consider whether emissions are to be reduced directly by the financed actions, whether they may include potentially less measurable long-term effects, and how and over which time horizon emission reductions are to be measured. Even if the AAU market will not continue to be part of future international agreements, proper integration of these lessons can contribute to strengthening the carbon market and could be used for other international fund based approaches, like NAMAs in developing countries.
## Annex 1: Summary of GIS design elements in CEE countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount of AAUs</th>
<th>Priority areas</th>
<th>MRV of emissions reductions/revenues</th>
<th>Coverage of project costs</th>
<th>Compatibility with national projects/programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>Surplus AAU: ~200 million 7 million AAUs sold to Austria in 2011-2012</td>
<td>Energy efficiency in buildings, energy saving measures in heating installations including solar installations, regulation and heat distribution and switch to biomass, introduction of efficient lighting, energy production from biomass and biogas</td>
<td>Verification of the implementation and achieved results of the projects is done by accredited independent organizations, including organizations accredited by the UNFCCC</td>
<td>Information not available</td>
<td>Information not available</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>158 million AAUs allocated to GIS, out of which 102,4 million AAUs sold between 2009-2012.</td>
<td>Energy efficiency and use of renewable energy sources (biomass) in buildings.</td>
<td>Monitoring Committee consisting of Ministry representatives. International auditor to monitor financial flows as agreed with the buyer. At least 5% of the projects are checked on-site</td>
<td>In theory, 100% of investment costs can be covered. However, the average subsidy so far was about 60-65%</td>
<td>Households living in panel buildings and applying for the GIS funding should not simultaneously participate in the national panel-buildings support program</td>
</tr>
<tr>
<td>Estonia</td>
<td>Surplus of 85 million AAUs allocated to GIS. 72.65 million AAUs sold between 2010-2012.</td>
<td>Energy efficiency and use of renewables in households and public buildings, energy efficiency of energy infrastructure, renewable electricity and transport, wind power, public transport.</td>
<td>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 the buyer</td>
<td>Information not available</td>
<td>Enlargement of existing EU structural funds programmes</td>
</tr>
<tr>
<td>Hungary</td>
<td>~ 45-55 million AAUs allocated to GIS. 11 million AAUs have been sold between 2008-2009.</td>
<td>Energy efficiency in the residential sector and in public transport.</td>
<td>Monthly and annual audit reports prepared by an independent auditor and the Department for Green Economy Development of the Ministry for National bonus based on attained energy efficiency level, less than 100% coverage (50-70% at most)</td>
<td></td>
<td>Hungary allows for support also in areas where other state or EU funding is available</td>
</tr>
<tr>
<td>Country</td>
<td>AAUs allocated to GIS</td>
<td>Energy efficiency</td>
<td>Development 60% depending on the programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
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<td>-------------------</td>
<td>------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>~18.5 million AAUs sold.</td>
<td></td>
<td>Less than 100% coverage. For the first tender high intensity of support (85%). The Latvian GIS does not build on any other national programmes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>AAU surplus totals 500 million (200 million downgrade from 2008 estimations), ~500 million AAUs allocated to GIS Contracts for EUR134 million</td>
<td>Energy management in public buildings, biogas and biomass, construction and reconstruction of electricity networks for connecting renewable wind energy sources, energy-efficient street lightning, urban transport Poland allows also soft greening such as research and educational activities</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Information not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Information not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>~1000 million AAUs allocated to GIS. 400 million as a tentative purchase target since 2009 47 million sold in 2009.</td>
<td>EE in building, EE in Kiev subway, Reconstruction in public and residential building, Thermal measurement equipment, District heating, Mining sector modernization, Waste water treatment</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stated in the contracts with buyers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Information not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>80 million AAUs allocated to GIS.</td>
<td>Renovation of public buildings, Installation of biomass boilers</td>
<td>Monitoring and verification involve third party and buyers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50-100%</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Information not available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Sales/Plans</td>
<td>Regulations</td>
<td>Bank/Ministry</td>
<td>Status</td>
<td>Notes</td>
</tr>
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<td>-------------</td>
<td>-------------</td>
<td>---------------</td>
<td>--------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Romania</td>
<td>30 million AAUs sold and environmentally friendly vehicles.</td>
<td>assessments or inspections, the specification of which are part of an AAUPA</td>
<td>Not defined.</td>
<td>The proposed scheme has been discarded, no new regulations have been put in place, no transaction has been made.</td>
<td>Information not available</td>
</tr>
<tr>
<td>Russia</td>
<td>Aims to sell 200 million AAUs</td>
<td>Not defined.</td>
<td>The state-owned ‘SberBank’ is responsible for GIS together with the Ministry of Finance</td>
<td>Not decided yet</td>
<td>Information not available</td>
</tr>
<tr>
<td>Slovakia</td>
<td>92 million AAUs could be sold under GIS, 50 million AAUs planned to be sold in a controversial deal, which was stopped, only 15 million transferred to the buyer.</td>
<td>Not defined.</td>
<td>Not defined.</td>
<td>Information not available</td>
<td>Information not available</td>
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8. Annex 2: AAU deals concluded as of end 2012

Note: the prices are estimations based on different market sources and not officially confirmed.

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<thead>
<tr>
<th>Month</th>
<th>Year</th>
<th>Seller</th>
<th>Buyer</th>
<th>Million AAUs</th>
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<td>2008</td>
<td>Hungary</td>
<td>Belgium</td>
<td>2</td>
<td>€14</td>
<td>Building energy efficiency</td>
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<tr>
<td>November</td>
<td>2008</td>
<td>Slovakia</td>
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<td>15</td>
<td>€10</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>2008</td>
<td>Hungary</td>
<td>Spain</td>
<td>6,6</td>
<td>€11-12</td>
<td>Building energy efficiency</td>
</tr>
<tr>
<td>March</td>
<td>2009</td>
<td>Ukraine</td>
<td>Japanese government</td>
<td>30</td>
<td>€11-12</td>
<td>Coal mine water treatment, energy efficiency in public facilities and central heating system, transportation</td>
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<tr>
<td>March</td>
<td>2009</td>
<td>Latvia</td>
<td>Netherlands</td>
<td>3</td>
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<td>March</td>
<td>2009</td>
<td>Czech Republic</td>
<td>Japanese government</td>
<td>40</td>
<td>€10-12</td>
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<td>2009</td>
<td>Latvia</td>
<td>Austria</td>
<td>2</td>
<td></td>
<td>Biomass, biogas, small hydro, energy efficiency</td>
</tr>
<tr>
<td>May</td>
<td>2009</td>
<td>Ukraine</td>
<td>Asuka Green Investment, Itochu, Marubeni, Mitsui, Sojitz and Sumitomo</td>
<td>14</td>
<td></td>
<td>Project include electric cars (agreed in 2012)</td>
</tr>
<tr>
<td>September</td>
<td>2009</td>
<td>Latvia</td>
<td>Spain</td>
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<td>2009</td>
<td>Czech Republic</td>
<td>Mitsui</td>
<td>20</td>
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<td>2009</td>
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<td>Austria</td>
<td>3.5</td>
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<td>2009</td>
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<td>Spain</td>
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<tr>
<td>November 2009</td>
<td>Poland</td>
<td>Spain (via EBRD)</td>
<td>2.5</td>
<td>€10</td>
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<td>November 2009</td>
<td>Hungary</td>
<td>Mitsubishi</td>
<td>3</td>
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<td>Latvia</td>
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<td>1.5</td>
<td></td>
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<tr>
<td></td>
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<td>Biomass, biogas, small hydro, energy efficiency</td>
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<td>Ukraine</td>
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<td>Modernization of a steel mill</td>
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<td>n.a.</td>
<td>n.a. Latvia</td>
<td>Japan private</td>
<td>1.5</td>
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<td>March 2010</td>
<td>Czech Republic</td>
<td>Japan (Mitsui)</td>
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<tr>
<td></td>
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<td>Residential and public buildings</td>
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<td>April 2010</td>
<td>Czech Republic</td>
<td>Japan (Mitsui)</td>
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<td>April 2010</td>
<td>Estonia</td>
<td>Austria</td>
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<td>€5-7</td>
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<td>Energy efficiency and use of renewable energy at small boilerhouses and improving of district heating networks</td>
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<td>April 2010</td>
<td>Poland</td>
<td>Japan (unknown)</td>
<td>2.2</td>
<td>€5-7</td>
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<td>Poland</td>
<td>Japan (unknown)</td>
<td>4.7</td>
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<td>July 2010</td>
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<td>Spain</td>
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<td>€8-9</td>
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<td>Wind turbines, environmentally-friendly buses</td>
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<td>August 2010</td>
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<td>Luxembourg</td>
<td>5</td>
<td>€6</td>
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<td>Energy efficiency improvement in apartment buildings and private houses</td>
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<td>Japan (Mitsui)</td>
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<tr>
<td>September 2010</td>
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<td>Japan (Marubeni),</td>
<td>3</td>
<td>€5-7</td>
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<tr>
<td>November 2010</td>
<td>Estonia</td>
<td>Japan (Mitsubishi)</td>
<td>1.5</td>
<td>€5-7</td>
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<td>Value</td>
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<td>Description</td>
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<tr>
<td>December 2010</td>
<td>Czech Republic</td>
<td>Japan (Mitsui)</td>
<td>9.55</td>
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<td>Residential and public buildings</td>
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<td>Japan (Marubeni)</td>
<td>3</td>
<td>€5-7</td>
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<td>December 2010</td>
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<td>Japan (Sumitomo)</td>
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<td>May 2011</td>
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<td>World Bank</td>
<td>2.6</td>
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<tr>
<td>January 2011</td>
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<td>Energy efficiency in 19 public buildings</td>
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<td>January 2011</td>
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<td>Japan (SMBC)</td>
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<td>January 2011</td>
<td>Estonia</td>
<td>Japan (SMBC)</td>
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<tr>
<td>January 2011</td>
<td>Estonia</td>
<td>Japan (Mitsubishi)</td>
<td>10</td>
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<td>Electric vehicles for social workers</td>
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<td>May 2011</td>
<td>Estonia</td>
<td>Spain</td>
<td>7.5</td>
<td>€5-7</td>
<td>Energy efficient trams for Tallinn</td>
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<td>December 2011</td>
<td>Bulgaria</td>
<td>Austria</td>
<td>1</td>
<td>€5-7</td>
<td>Thermal rehabilitation of public buildings, biomass, biogas</td>
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<td>December 2011</td>
<td>Lithuania</td>
<td>Japan (Marubeni), Spain, Luxembourg</td>
<td>30</td>
<td>€2-4</td>
<td>Renovation of public buildings, installation of biomass boilers and environmentally friendly vehicles.</td>
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<tr>
<td>January 2012</td>
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<td>Japan (Marubeni)</td>
<td>1.55</td>
<td>€2-4</td>
<td>Efficient lighting, hybrid buses</td>
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<tr>
<td>May 2012</td>
<td>Czech Republic</td>
<td>Japan (Mitsui)</td>
<td>12.5</td>
<td></td>
<td>Energy efficiency in residential and public buildings</td>
<td></td>
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<td>June 2012</td>
<td>Bulgaria</td>
<td>Austria</td>
<td>6</td>
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<td>Insulating homes and funding renewable energy sources</td>
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<td>September 2012</td>
<td>Estonia</td>
<td>Austria</td>
<td>10.9</td>
<td>€2-5</td>
<td>Establishment of energy efficient street lighting systems (7 cities), Saving energy in district heating networks and</td>
<td></td>
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</tbody>
</table>
boilerhouse reconstruction (22 projects)

<table>
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<th>Country 2</th>
<th>Amount</th>
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<td>2012</td>
<td>Poland</td>
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<td>Total</td>
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<td>453,85</td>
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*Source: see country chapters above*
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**Personal communications**

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[Personal communication 6, 2012] Hannu Lamp, Estonian Ministry of Environment

[Personal communication 7, 2010] Valdis Bisters Latvia Ministry of Environment, Climate and Renewable Energy Department

[Personal communication 8, 2012] Ilse Pruse, Latvia Ministry of Environment, Climate and Renewable Energy Department

[Personal communication 9, 2011] Olha Semkiv, Point Carbon


[Personal communication 11, 2009] Helmut Schreiber, consultant to the World Bank

[Personal communication 12, 2010] Maurits Henkemans, Dutch Ministry of Economic Affairs

[Personal communication 13, 2013] Spanish governmental representative
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