

Ukraine
Options for Designing a Green Investment
Scheme under the Kyoto Protocol

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Sustainable Development Department
Europe and Central Asia Region

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This report was prepared by the World Bank at the request of the Government of Ukraine, with funding from the World Bank's Carbon Finance Unit. It is intended to help the Government of Ukraine make an informed decision about a strategic approach to assigned amount unit (AAU) trading, including a pipeline of possible projects, programs and other activities implemented under a Green Investment Scheme.

Separately from this report, the World Bank is engaged in various aspects of carbon finance in its efforts to help governments address the United Nations Framework Convention on Climate Change and the Kyoto Protocol to that Convention. The World Bank's engagement in carbon finance currently consists of acting as trustee for the administration of eight funds with funding pledges from governments and companies in OECD countries of nearly \$1.93 billion (for more details see www.carbonfinance.org) which are used to purchase project-based greenhouse gas emission reductions in developing countries and countries with economies in transition.

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Abbreviations

AAU	Assigned amount unit
CC	Carbon equivalent emissions certificate
CER	Certified emission reduction
CO ₂ e	Carbon dioxide equivalent
ERU	Emission reduction unit
EUA	European Union Allowance
GHG	Greenhouse gas
GIS	Green Investment Scheme
IET	International Emission Trading
IFC	International Finance Corporation, World Bank Group
JI	Joint implementation
Mt	Million tons
NGO	Nongovernmental organization
PHRD	Japan Policy and Human Resources Development Fund
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDROIT	International Institute for the Unification of Private Law

About the Report

1. This report was prepared by the World Bank at the request of the Ministry of Environmental Protection of Ukraine. Funding for this study has been provided by the World Bank's Carbon Finance Unit.

THE AIM OF THE REPORT

2. This Report describes and discusses assigned amount unit (AAU) asset management and Ukraine's position under the Kyoto Protocol; the regulatory measures needed in Ukraine to trade surplus assigned amount units; and considerations and recommendations on how to organize a transaction, manage risks and green assigned amount units. Annexes to this report provide support and detail to the main text.

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4. The report was prepared using a range of sources, both documents and interviews. Interviews have been conducted with individuals in the Ministry of Environmental Protection, Ministry of Fuel and Energy, Ministry of Coal Industry, Ministry of Finance, Ministry of Economy, Ministry of Industrial Policy, Ministry of Transport and Communication, Ministry of Agrarian Policy, the Committee of State Forestry, the State Committee of Ukraine on Water Issues, the Environmental Committee at Ukrainian Parliament, the Climate Change Center of Ukraine, the World Bank, UNDP, private companies involved in various sectors of the Ukrainian economy, independent experts, and non-governmental organizations, between January and September 2006.

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Executive Summary

This report examines issues surrounding the greening of assigned amount units (AAUs) to provide Ukraine and interested parties with an overview of considerations and approaches to potential transactions involving a sale of AAUs and implementation of a green investment scheme. The report was prepared at the request of the Government of Ukraine, based on a detailed review undertaken by a team of experts from the World Bank and consultants Climate Focus and Vertis Environmental Finance.

OPPORTUNITY FOR UKRAINE

1. Achieving energy security, promoting energy efficiency and addressing climate change are critical economic priorities for Ukraine. The Kyoto Protocol and international emission trading could present an opportunity for Ukraine to raise significant funds to finance environment-friendly investments in energy, industry, transport, housing, forestry, agriculture and education. The report *Ukraine Options for Designing a Green Investment Scheme under the Kyoto Protocol* contains recommendations that could be pivotal for Ukraine to realize such economic priorities and prospects for raising significant new financing using Ukraine's surplus emission credits under the Kyoto Protocol.

2. Under the Kyoto Protocol industrialized countries have committed to reduce their greenhouse gas emissions (GHG) during 2008–12. Emission reduction commitments are defined as a cap on the volume of greenhouse gases (GHGs) that can be emitted and are quantified by Assigned Amount Units (AAUs) allocated to each participating industrial country and economies in transition (EIT). The flexible mechanisms of the Kyoto Protocol enable industrial countries to meet these targets while reducing compliance costs and investing in climate-friendly projects in EIT and in developing countries.

3. Many of the EU-15 countries, Canada, and Japan have emissions that are above their targets under the Kyoto Protocol; in addition to domestic measures, they plan to use the flexible mechanisms to meet their targets. At the same time, Ukraine, Russia, and other economies in transition are expected to have significant surplus AAUs, which present trading opportunities for the mutual benefit of industrialized and transition countries. The Ministry of Economy estimates Ukraine's surplus AAUs to be around 2.2 billion for 2008-12.¹

THE DEMAND FOR AAUS

4. Demand will vary considerably depending on whether EU member states compensate for shortfalls with other EU members, whether Canada seeks compliance, and whether Russia participates in IET. Based on the review, demand for AAUs is expected to be lower than available surplus AAUs from economies in transition. Scenarios indicate that the potential demand for AAUs would be in the range of 0.13 – 0.72 billion during the period 2008-12. There is no active market for

¹ The report assumes a conservative estimate of 1.5 billion for 2008-12.

AAUs today and forward trading is limited. Therefore, significant competition can be expected to emerge among EIT sellers of surplus AAUs.

Some Parties (e.g. Italy, Spain, Japan) have confirmed potential interest in acquiring AAUs. These potential sovereign buyers have also indicated that support from their domestic constituencies for buying surplus AAUs could be secured only if the proceeds from AAU transactions are used for projects or programs that reduce GHG emissions or have other tangible environmental benefits. Some EITs, with bilateral support including from the World Bank, have proposed establishing a “Green Investment Scheme (GIS)” to satisfy potential buyers’ concerns that AAU proceeds be channeled to prior-identified projects and programs that yield environmental benefits.

5. The Kyoto Protocol neither prescribes nor defines GIS. Thus, the GIS would be voluntary and may take different forms. GIS can rely on individually negotiated transactions or involve institutionalized schemes. Ukraine should engage with potential buyers to discuss Ukraine’s priorities and to understand buyers’ preferences for greening. The GIS should ensure a mechanism to verify emission reductions from GIS activities. The report recommends that Ukraine design and implements a GIS. The World Bank is ready to assist Ukraine in this regard.

PROSPECTS FOR UKRAINE

6. Team discussions have indicated that sovereign buyers want well-structured proposals for AAU purchases. A GIS design should be consistent with government policy to manage trading and greening, and have sound procurement, financial and environmental monitoring, and reporting mechanisms. This report examines several options for establishing a GIS in Ukraine and recommends as follows.

FISCAL ARRANGEMENTS

7. Establish the GIS as a targeted program in the Special Fund of the Ukrainian budget with the multi-year nature of the program embedded in the legal agreements for the Fund. This would ensure transparent fund flow and be consistent with fiscal policy. It was determined that: (a) constituting a GIS as one or more independent legal entities or extra-budgetary funds to channel GIS proceeds to greening may satisfy buyers’ preferences for earmarking and separation of funds from the budget but would be inconsistent with ongoing public finance reforms; and (b) using an existing environmental fund would be unsatisfactory to support a GIS in view of inefficiencies in their operation and implementation.

AAU INVENTORY AND MANAGEMENT

8. Sound AAU management is key to credible and robust AAU transactions and affects their risk rating and hence their value; AAU transactions impact Ukraine’s sovereign climate change obligations including the use and allocation of AAUs for Joint Implementation (JI), AAU trades, and the national compliance reserve. Coordination is critical to meet these obligations and to implement the GIS. Therefore this report recommends a parallel AAU management function to keep track of the country’s actual and future AAU assets and liabilities including the

transfer of AAUs from the national registry of Ukraine to the registries or registry sub-accounts of potential buyers. This approach is cost effective and avoids duplication of efforts to meet Ukraine's Kyoto Protocol obligations. Capacity building for AAU management and support to establish a GIS can be eligible for financing from the AAU sale proceeds, thereby minimizing or avoiding national budget allocations to manage and operate the GIS.

9. Ukraine as an Annex-1 Party to the Kyoto Protocol is required to meet and maintain IET eligibility requirements. Implementation of the trading infrastructure is well advanced and Ukrainian officials confirm that the country will meet all criteria to participate in IET by the beginning of 2007. The report found that Ukraine's decision to rely on nationally developed software rather than procuring a standardized and tested registry system constitutes a risk for Ukraine and counterparts that rely on the functioning of the registry. With minimal incremental effort Ukraine could achieve eligibility with Kyoto Protocol and various grant-funding programs are available to support Ukraine in this.

DOMESTIC LEGAL FRAMEWORK

10. The Cabinet of Ministers passed the National Plan for Compliance with the UN Framework Convention on Climate Change and the Kyoto Protocol on August 18, 2005 (Decree No. 346-p), which establishes an inter-government commission to comply with Ukraine's international obligations and passes Ukraine's National Compliance Program. On September 12, 2005 President Yuschenko signed a Presidential Decree (No. 1239/2005)², which confirmed the appointment of the Ministry of Environmental Protection as coordinator of measures to implement the Kyoto Protocol, and mandates the Cabinet of Ministers to establish a procedure to coordinate compliance with the Protocol.

11. Domestic legislation is needed to define and clarify the authority to execute AAU trades and establish GIS. A programmatic and long-term GIS involving private beneficiaries and new administrative functions would require a formal law. However, for simple transactions involving only sovereign parties, Ukraine's executive authority would be sufficient to conduct AAUs transactions. Research indicated that a GIS could be implemented through government decrees until a formal law is passed; the Government chose a similar path for Joint Implementation.

PROJECT PIPELINE

12. GIS proceeds can support investments in projects or programs that reduce GHGs or provide other environmental benefits such as reducing industrial pollutants. GIS proceeds can support other broader initiatives such as capacity building, policy change, or the administrative costs of the GIS itself.

13. A pipeline of projects for GIS that can be implemented relatively quickly is important. The report examines nine emission-intensive sectors of the Ukrainian

²Based on Article 106 of the Constitution, which says, "the President can issue mandatory decrees and regulations on the basis of the Constitution and Ukrainian laws".

economy and confirms significant greening potential particularly in the fuel and energy, heat and power generation, iron and steel, industrial energy use, the residential sector, agriculture, waste management, transport and forestry sectors. The report recommends that Ukraine set transparent criteria for project selection (e.g. status of preparedness and readiness for implementation) to develop a project pipeline.

14. While AAU trading is confined to 2008–12, GIS can capture emission reductions and other benefits from projects during pre-2008 and post-2012 allowing longer lead times for projects and implementation. A structure exists for funding projects that reduce emissions, namely Joint Implementation. A GIS could complement JI and enhance benefits because GIS flexibility can support projects that face barriers under JI—when emission reductions are difficult to verify, when the timing extends beyond 2012, or when delivery guarantees are needed for JI projects.

GIS FUNDING AND MANAGEMENT

15. The funding mechanisms that Ukraine uses to disburse funds—e.g., investing in equity, provision of debt, issuance of guarantees or provision of grants—should be carefully considered since this will influence recipients' behavior and the outcome of their projects and programs. Funding could also be provided to establish programs or initiatives that reduce emissions and have potential for replicability, to develop and implement policies to reduce emissions, to leverage private financing into public-private partnership activities, or to provide soft financing for certain investments. This report recommends a generic GIS organizational structure [Section 5] and proposes a professional manager under a performance-based contract to manage AAU trading and greening activities, and a supervisory body for oversight and fiduciary arrangements. A decision to engage in GIS should not burden the budget since the GIS can be financed from AAUs sales proceeds.

16. Since AAUs cannot be transferred until 2008, Ukraine could decide to enter the market now under a forward contract, or at a future date, once eligible, on the spot market. Ukraine's strategy should be guided by risk mitigation and thereby strengthen the terms of sale for its AAUs. This report considers a price range between €1 and €10 per AAU—reflecting the many uncertainties in the carbon market including post-2012 obligations, the fact that the market is in its infancy, the small demand and limited number of buyers, and the fact that AAUs cannot be used for private-sector compliance in the EU ETS. Risks can be addressed in many ways including by establishing a credible and transparent GIS, contractual terms, provision of guarantees, and purchase of insurance. The report recommends that Ukraine enter the market early using the forward contract approach for the reasons noted above, and the fact that some EITs (e.g., Romania, Bulgaria, Slovakia, and Latvia) are already discussing AAU trading with potential buyers of AAUs.

17. The first transactions are likely to be government-to-government. Only Japan has authorized its private sector to hold AAUs—to be restricted to a few buyers. Spain, Italy, and Japan seem particularly promising candidates to market Ukraine's AAUs because of their expected difficulties in meeting their Kyoto targets. In this

scenario Ukraine may consider negotiating an institutional arrangement and contract individually with each (government) buyer. A forward contract—where AAUs are delivered in installments, payments follow AAU delivery and partial performance of greening, but remaining AAUs are delivered prior to completion of greening—seems to offer the most balanced approach for Ukraine. Several other approaches are reviewed in Section 4 of the report.

PILOT AAU-SALE TRANSACTION—NEXT STEPS

18. One or more small volume pilot transactions (around 10 – 20 million AAUs) might be useful to test potential buyers’ readiness to act, and for Ukraine, to gain, low-risk AAU trading experience. Pilot transactions could raise funds to support greening projects and administration of AAU trading and GIS, and to test the legal framework and potential multi-sector GIS structures such as project selection and appraisal, fund management, monitoring and verification of greening. The report recommends that Ukraine consider a pilot transaction as soon as possible with selected buyers.

19. To move to a pilot transaction and greening Ukraine would need to do the following:

- Adopt a government resolution to manage national AAU assets and participate in international emission trading that specifies greening criteria, and responsibilities and principles for negotiating and concluding pilot sales up to an established volume of assigned amount units
- Prepare a term sheet setting out the target terms and conditions
- Select low-risk and quick-to-implement greening projects, and attach a concise and persuasive project description to the term sheet
- Approach several motivated buyers and establish a clear timeframe and process for closing the transaction
- Select the best buyer terms and complete the transaction by agreed deadline

This process could be implemented in a few months and the external costs could be expected to be about US \$350-700K. A pilot would allow Ukraine to test the institutional framework, review state investment rules, and develop a comprehensive institutional model and regulatory framework for GIS—the lead time for this could be about one year. The World Bank would be prepared to provide technical assistance to Ukraine in establishing a GIS, including in its pilot phase. The provision of this technical assistance would be independent of any solicitation or offer the World Bank may make in its role as a potential buyer of AAUs.

SUMMARY

20. In summary Ukraine’s interest in implementing a GIS appears feasible as Ukraine has ample surplus AAUs. A pilot transaction would allow Ukraine to test the market, gain early trading experience and funding for further greening and for the establishment of a full fledged GIS. This could be implemented within a few months. If so requested the World Bank would help Ukraine further as appropriate in this regard.

Section 1. Ukraine in the Global Carbon Market

This section explains Ukraine's opportunity and limitations under the Kyoto Protocol and with respect to the global carbon market. Ukraine's ability to benefit from its potentially large surplus, and the value of this surplus, depends on how the overall carbon market develops.

UKRAINE AND THE KYOTO PROTOCOL

1. Under the Kyoto Protocol certain industrialized countries have committed to reduce their greenhouse gas (GHG) emissions during the period 2008-12. These emission reduction commitments are defined as a cap on the amount of greenhouse gases a country is allowed to emit during the 2008-12 period. This cap is quantified by assigned amount units (AAUs) allocated to each participating industrialized country. Countries can meet their commitments by reducing domestic emissions or by importing emission credits via one of the Kyoto Protocol's so called "flexible mechanisms".

2. Economic contractions since 1990 are expected to leave Ukraine, Russia, and other countries of Central and Eastern Europe with significant surpluses of Assigned Amount Units. These surplus assigned amount units could have great economic value if they can be bundled and sold to countries that need them to meet their Kyoto commitments, but much uncertainty surrounds the eventual size of the surpluses, their market value, and how they might be traded.

3. Ukraine's position under the Kyoto Protocol is one of a net seller of *assigned amount units* (AAUs);¹ the country holds a significant surplus of assigned amount units, which are a state asset. Decisions concerning whether, when, and how to market these surplus assigned amount units depends on the development of the carbon market and market projections, Ukraine's emission projections and reserve needs, cash flow and investment requirements, and the general demand for assigned amount units.

UKRAINE'S SURPLUS

4. Ukraine is projected to have a substantial surplus of assigned amount units that could be traded fully or in part. The surplus is due mainly to a drop in GHG emissions during the economic recession from 1990-96. For example, in 1999, the country's emissions were 43 percent below the 1990 level.

5. Projections of Ukraine's AAU surplus vary,² but most experts put it between 1-2 billion for the first commitment period (2008-12).³ The Ministry of Economy estimates the headroom at 2.225 billion AAUs and proposes that 50 percent of this surplus is held in reserve during the first commitment period. The total volume of

¹ For more information of the international legal framework for emission trading refer to Annex A.

² For more detail of Ukraine's Greenhouse Gas Inventory refer to Annex B.

³ Estimates from the Second National Communication of Ukraine and from the "The National Strategy of Ukraine for Joint Implementation and Emission Trading", from the Ministry of Environmental Protection of Ukraine.

assigned amount units that could be traded under this scenario would be 1.125 billion.⁴ In this report a conservative AAU surplus of 1.5 billion is assumed.

6. Ukraine's actual surplus of assigned amount units under the Kyoto Protocol will depend on GHG emissions during 2008-12, which is difficult to predict because emissions depend on several dynamic variables. For example, Ukraine's ongoing efforts to improve energy efficiency across the economy will reduce GHG emissions even as the economy grows; planned increases in nuclear power capacity will also reduce emissions. However, Ukraine is also expanding the use of domestic coal as an energy source, which would increase GHG emissions. The net result of these developments will determine future greenhouse gas emissions.

THE MARKET FOR UKRAINE'S SURPLUS

7. There is no active market for AAUs and limited forward trading. No assigned amount units will be issued before 2008.

8. Today there are two main carbon markets and they influence each other.⁵

- The international market for compliance under the Kyoto Protocol,
- The European Union (EU) Emission Trading Scheme.

The EU governments use the EU Emission Trading Scheme as a means to achieve their targets under the Kyoto Protocol. The EU Emission Trading Scheme engages the private sector in achieving compliance with the EU's obligations under the Kyoto Protocol. Certain instruments from the Kyoto Protocol, namely emission reduction units and *certified emission reductions* (CERs), can be used for compliance in both the Kyoto Protocol and under the EU ETS. In contrast, EU governments have not authorized the private sector to use assigned amount units to achieve compliance under the EU Emission Trading Scheme.

9. However the Japanese government has confirmed that it will authorize their local private sector to acquire and hold assigned amount units. In April 2005 Japan adopted the "Kyoto Protocol Target Achievement Plan". This plan relies heavily on Kyoto flexible mechanisms and includes explicit reference to Green Investment Schemes. Japanese entities, both private and public, have shown strong interest in Green Investment Schemes.

10. As a consequence and in the short term, it is expected that AAU trading will be principally between sovereign states and Japanese private sector entities. Small quantities of assigned amount units may also be purchased by speculative buyers and funds. The trades could be structured bilaterally or channeled through carbon funds. The GIS arrangements would pool selling country interests in a manner similar to a carbon fund on the buyers' side.

⁴ Ministry of Economy, October 2006.

⁵ The term "carbon market" is used for convenience, referring to emission trading systems based around carbon dioxide emissions and other greenhouse gas emissions.

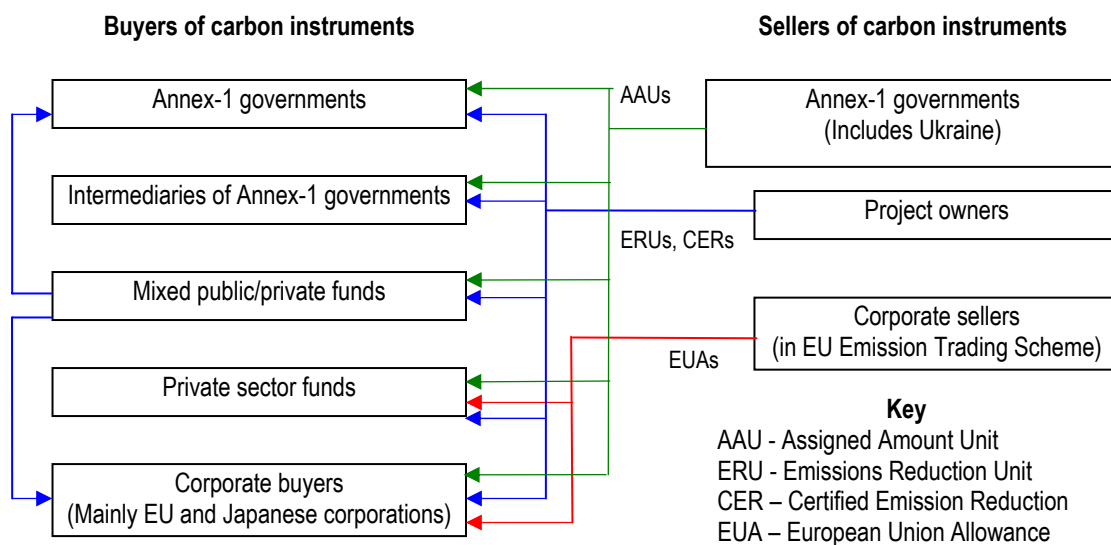


Figure 1. Structure of the carbon market

SCENARIOS OF DEMAND AND SUPPLY FOR AAUs

11. The value of Ukraine's surplus assigned amount units depends on the balance between supply and demand.

12. The overall demand for assigned amount units will depend on:

- Whether the EU-15 and Japan use part of their Kyoto compliance budget on international emission trading and what approach they take towards trading;
- Whether individual EU-15 countries will reduce emissions if the EU-15 as a whole is projected to comply with the target under the Kyoto Protocol;
- Whether Canada takes steps to comply with its Kyoto target.

13. Many of the EU-15 countries, Canada, and Japan have emissions that are currently above the targets they have assumed under the Kyoto Protocol. In addition to domestic measures, Japan and many EU countries plan to use the Kyoto Protocol's flexible mechanisms to comply with their GHG emission targets. Canada is less active in the carbon market and there are no indications that it will use *international emission trading* (IET) as part of its compliance strategy.

14. Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Spain and Sweden have together allocated EUR2.8 billion to meet their GHG emission targets using the Kyoto Protocol's flexible mechanisms. These funds will be used to procure around 552.5 million tonnes of carbon credits or about 30 percent of the EU-15's overall emission reduction target of 8.0 percent. Considering all planned and implemented measures, projected removals and achievements with use of the flexible mechanisms, the EU-15 is expected to meet this target.⁶ However this

⁶ *Greenhouse Gas Emission Trend and Projections in Europe 2006* (European Environment Agency, Copenhagen, October 2006).

projection assumes that over-delivery by some EU member states will compensate for shortfalls by other member states.

15. Japan's emission reduction target is -6 percent of its 1990 emission levels. Japan's current annual emissions are 880 million tons above this target and this short position is estimated to increase to 1.06 billion tons by the end of the first commitment period.⁷ Moreover, Japan has a relatively energy efficient economy, limiting its potential to reduce domestic emissions.

16. Table 1 below shows the overall demand for assigned amount units.

Table 1. Expected demand from parties to the Kyoto Protocol

Country	Possible demand (million AAUs)
Japan's projected compliance gap	1,060
Canada's projected compliance gap	1,189
EU-15 planned use of the Kyoto flexible mechanisms	553
Total compliance gap of EU-15 countries projected to miss their Burden Sharing Agreement target	537
Total	3,339

Note: This multi-country compliance could be filled using IET, by increasing domestic GHG emission reduction efforts or by extending the use of joint implementation and clean development mechanism. Key GHG data – GHG emissions data for 1990-2003 submitted to the UNFCCC (November 2005).

17. On the AAU supply side, Russia has the largest surplus, followed by Ukraine and other central European countries. The UNFCCC projection of Russia's future emissions leads to an estimate Russia's AAU headroom of about 1,360 million tons.⁸ This seems conservative since other sources estimate that it exceeds 2 billion tons.⁹

⁷ Based on UNFCCC projections.

⁸ Key GHG data – Greenhouse gas emissions data for 1990-2003 submitted to the UNFCCC, November 2005. Calculation based on the UNFCCC projection of Annex-1 country's emissions in 2010 in the "with measures scenario" and estimations of the Party's assigned amount. The "with measures" scenario includes those policies and measures that have already been implemented and adopted at the time when the projections were prepared. The projections include data on emissions or sinks from Land Use Change and Forestry. The estimates of assigned amount do not include purchases of additional credits with the Kyoto flexible mechanisms.

⁹ For example, in a presentation delivered at an emission trading conference in Brussels, July 2006, ICF Consulting estimated Russia's AAU surplus at 2.4 billion.

18. Table 2 summarizes expected main suppliers of assigned amount units.

Table 2. Expected supply of AAUs

<i>Country</i>	<i>Surplus (million AAUs)</i>
Russia	1,360
Ukraine	1,500
Romania	386
Bulgaria	172
Poland	151
Czech Rep.	186
Estonia	113
Latvia	52
Slovakia	60
Total EU	1,120
Total	3,980

Note: Calculation based on the UNFCCC projection of Annex-1 Parties' emissions in 2010 and estimations of the Party's assigned amount. Key GHG data –GHS emissions data for 1990-2003 submitted to the UNFCCC (November 2005). The emission projections differ depending on the source. The Second National Communication of Ukraine estimates Ukraine's surplus at between 2.3 and 2.5 billion AAUs. The Ministry of Environmental Protection published "The National Strategy of Ukraine for Joint Implementation and Emission Trading" (NSU) with an estimate of between 1.5 and 1.8 billion, which is close to the World Bank's estimate of 1.8. The 1.5 billion mentioned in this table is a conservative estimate.

19. Scenarios of net demand and supply depend mainly on whether Canada seeks compliance and whether Russia meets IET eligibility. Depending on Russia's Kyoto position, the overall position of the Kyoto Protocol compliance market could vary dramatically (Table 3). If Russia meets IET eligibility criteria, most scenarios will show an overwhelming net surplus of assigned amount units, implying a low market price unless there are deliberate supply constraints.

Table 3. Scenarios of overall AAU demand and supply

<i>Figures in million AAUs</i>	<i>Russia out</i>	<i>Russia in with +1.5bn</i>	<i>Russia in with +3bn</i>	<i>Russia in with +4.5bn</i>
Canada fully in	719	-781	-2,281	-3,781
Canada half in	125	-1376	-2,876	-4,376
Canada out	-470	-1,970	-3,470	-4,970

Note: Negative values indicate a surplus; positive values indicate a shortage.

20. Sellers will likely compete to offload their surpluses. They could compete in terms of timing with countries racing to trade; in terms of pricing with countries discounting to attract buyers; or in terms of quality with countries establishing reputations as reliable counterparts with transparent processes and guaranteed greening. Alternatively, sellers could cooperate, exchange experiences, and possibly coordinating their purchasing strategy to maximize their gains.

21. Similarly, supply constraints could be voluntarily imposed by purchasers and/or sellers through setting high standards for transactions, for example by imposing strict greening criteria.

THE VALUE OF UKRAINE'S SURPLUS

22. There is no market price for assigned amount units because there is no active market and limited forward trading. So far only Slovakia has engaged in a transaction that is governed exclusively by Article 17. Indirectly, however several countries have used this mechanism:

- Governments have committed to issue JI project developers with assigned amount units to reflect emission reductions taking place before 2008.
- International Emission Trading will be the underlying mechanism of the EU Emission Trading Scheme from 2008 on. Each cross-border transaction of a European Union Allowance will be accompanied by a transfer of an assigned amount unit between two governments.

23. A market price will only be established after trading begins; at the earliest in 2008. The value of Ukraine's surplus assigned amount units will depend on the balance between supply and demand. If Canada made an effort to comply with its Kyoto obligations (which is increasingly unlikely) and Russia does not achieve eligibility for trading, then Ukraine's surplus could be critical for countries to meet their Kyoto targets. In this scenario, Ukraine's credits would be very valuable. On the other hand, the most pessimistic scenarios would reduce demand essentially to the needs of Japan (provided the EU meets its demands internally). Ukraine would be competing with Russia for this limited demand and the value of assigned amount units could be very low.

24. Unlike the EU Emission Trading Scheme, where daily volumes of one to two million instruments are traded, there is currently little demand for assigned amount units. Assigned amount units can be used only for compliance under the Kyoto Protocol unlike emission reduction units generated under Joint Implementation. There is significant private sector interest outside Ukraine for Joint Implementation projects since emission reduction units together with European Union Allowances can be used by private sector entities to meet their compliance targets under the EU Emission Trading Scheme. The value, and thus the price, of assigned amount units cannot be compared with prices for emission reduction units or certified emission reductions, much less with those for a European Union Allowance. AAU prices are therefore expected to lie below the price for emission reduction units.

25. Carbon credit value is partly determined by the expectation that allowances could be banked for subsequent periods. While it is expected that there will be a climate change regime post 2012 this may be under a different framework to Kyoto obligations and may therefore cause the AAU price to drop.

26. Table 4 shows the potential market value of Ukraine’s AAU surplus under three scenarios provided Ukraine can successfully engage in AAU trading, if the market gets underway, and if it can be sustained.

Table 4. Potential market value of Ukraine’s Kyoto surplus

Price	Low volume 0.45 billion AAUs	Medium volume 1.0 billion AAUs	High volume 1.5 billion AAUs
Low (Euro 1)	€0.45 bn	€1 bn	€1.5 bn
Medium (Euro 5)	€2.25 bn	€5 bn	€7.5 bn
High (Euro 10)	€4.5 bn	€10 bn	€15 bn

SUMMARY

27. Many of the factors determining market value are beyond Ukraine’s control and are faced by other potential sellers. However, Ukraine can take steps to improve the value of its surplus including:

- Ensure sound management of its AAU assets and liabilities
- Design and implement transparent and credible GIS framework that includes mechanisms to monitor financial flows and verify environmental benefits
- Identify a pipeline of quick-to-implement projects for greening

28. The main demand for Ukrainian assigned amount units is likely to come from Japan, Italy, and Spain—Ukraine should target these countries first when marketing its assigned amount units.

Section 2. AAU Management

This section explains the general principles of AAU asset management and their importance in enhancing the value of Ukraine's surplus.

29. If Ukraine decides to transact assigned amount units it needs to first design a comprehensive strategy to manage its AAUs without compromising the country's Kyoto compliance position. In general, countries that hold AAUs surplus to their compliance targets need to develop an overall climate strategy prior to deciding how to manage their surplus, including how to use mechanisms defined by the Kyoto Protocol to maximize benefits to their domestic economy and the global climate.

30. A structured approach towards managing assigned amount units requires decisions on the use and allocation of assigned amount units for *joint implementation* (JI)¹⁰, AAU trades, and for the national reserve. These management obligations are mandatory under the Kyoto Protocol and can be built upon to support a GIS with minimal incremental effort.

31. The value of Ukraine's AAU surplus can be enhanced with transparent management of its assigned amount. Sound AAU management will create credible and robust AAU transactions and improve the risk rating of transactions, thus increasing the value of assigned amount units.

GENERAL PRINCIPLES OF AAU MANAGEMENT

32. Managing a country's position under the Kyoto Protocol is akin to managing assets and liabilities. In addition to managing the AAU assets and associated liabilities, a country should evaluate the complementarities of AAU transfers, participation in Joint Implementation, a Green Investment Scheme, domestic emission trading systems, and any other domestic climate policies.

33. Ukraine has an estimated 1.5 billion assigned amount unit surplus for the first commitment period (2008-12); the value (asset) will be a function of the eventual market price.¹¹

34. The net position is the difference between the number of assigned amount units held by Ukraine and the (predicted) amount of greenhouse gas (GHG) emissions (expressed in tons of CO₂-equivalent)¹² at the end of the first commitment period. The value of the net position is that figure multiplied by the market price of assigned amount units.

35. During a Kyoto Protocol commitment period the asset holder has the following options:

¹⁰ Joint implementation is a project-based mechanism under the Kyoto Protocol. For each calculated and verified emission reduction a JI project generates, the host country converts an AAU into an emission reduction unit that can be transferred to carbon purchasers from an investor country.

¹¹ Currently there is limited demand for AAUs and the market is still in its infancy.

¹² The global warming potential of greenhouse gas is expressed in 'tonnes of carbon dioxide equivalent'.

- Transfer assigned amount units,
- Acquire assigned amount units,
- Hold assigned amount units (and possibly bank assigned amount units to next commitment period).¹³

Article 17 of the Kyoto Protocol authorizes the transfer or acquisition of assigned amount units and establishes the basis for trading (selling and buying) them. A country's decision to buy assigned amount units would be based on a belief that their market value will increase. Similarly, a decision to bank them would be based on the belief that the market value of assigned amount units after 2012 will be greater, or that they may be needed to support the country's compliance position in a second commitment period. A decision to sell assigned amount units implies a belief that the asset will go down in value, or that returns from holding assigned amount units would be lower than those from holding an alternative asset.

36. Countries may decide to sell AAUs to raise liquidity for other purposes, such as investing the proceeds in measures that will reduce GHG emissions, which would free up more surplus assigned amount units; or creating other environmental benefits, a process known as "greening". The liabilities—the country's emissions—may also be managed through policy measures aimed at containing or reducing GHG emissions. These could include energy, transport, housing, forestry and agricultural policies, and so forth. Establishment of a so-called *Green Investment Scheme* (GIS) is one policy option to directly reduce emissions through promoting environmental investments and programs across the economy.

COORDINATION AND AAU OVERSIGHT

37. Ukraine may consider integrated management of its assets and liabilities under the Kyoto Protocol. Managing the country's compliance position under the Protocol through trading and through environmental and energy policies is a complex task touching the responsibilities of many Ministries. An integrated approach to this is likely to lead to the best economic and environmental outcome, requiring an AAU management function in parallel with a Green Investment Scheme.

38. Ukraine could consider establishing an AAU management system to keep track of the country's actual and future AAU assets and liabilities. An AAU management system could include functions such as:

- Accounting for the level of GHG emissions in Ukraine,
- Overseeing Ukraine's compliance with all obligations under the UNFCCC and the Kyoto Protocol,
- Establishing and maintaining the eligibility of Ukraine to participate in international emissions trading and joint implementation,
- Accounting for assigned amount units,
- Clearinghouse for all AAU-related contracts,

¹³ As international climate change negotiations are ongoing, it is not yet clear whether there will be agreement on a next commitment period. If there is a second commitment period, AAUs will be bankable into the next period for compliance purposes.

- Administrating assigned amount units in the context of an allocation under a Green Investment Scheme or similar programs, and
- Coordination with the UNFCCC Focal Point and relevant Ministries.

SUMMARY

39. Transactions involving AAUs impact Ukraine's sovereign climate change obligations including the use and allocation of AAUs for Joint Implementation (JI), AAU trades and for the national compliance reserve. Coordination is critical to meet these obligations and to implement the GIS. An AAU management function is recommended in parallel with the GIS to keep track of the country's actual and future AAU assets and liabilities. Capacity building for AAU management can be eligible for financing from the AAU sale proceeds.

Section 3. Regulatory and Legal Considerations

This section summarizes international and domestic regulatory and legal matters that must be addressed before Ukraine can sell or trade assigned amount units. These are not insurmountable but they will require sufficient funding and political will.

40. Greening is not defined under the Kyoto Protocol but much of the legal framework needed to provide the basis for a GIS is established within the Kyoto Protocol.

41. Ukraine will have to comply with Kyoto Protocol and decisions adopted under the Protocol to participate in international emission trading. To participate in a GIS Ukraine must also address the following regulatory issues.

- Provide regulations and authority to execute AAU trades and establish a Green Investment Scheme;
- Establish legal parameters to manage state budget funds.
- Take a decision on the type of AAU sales contract.

UKRAINE'S ELIGIBILITY FOR IET UNDER THE KYOTO PROTOCOL

42. The Parliament of Ukraine ratified the UNFCCC and the Kyoto Protocol on October 29, 1996,¹⁶ and on February 4, 2004,¹⁷ respectively. Under the Constitution of Ukraine¹⁸ and applicable law,¹⁹ the Protocol forms part of the national legislation of Ukraine.

43. The Kyoto Protocol defines industrialized (Annex-1) countries' caps on GHG emissions; countries may achieve these targets domestically or through the flexible market-based mechanisms of the Kyoto Protocol: *Joint Implementation (JI)*, the *Clean Development Mechanism* and *International Emission Trading (IET)*. See also Annex A.

44. Among Annex-1 countries under Article 17 of the Kyoto Protocol, international emission trading allows industrialized countries to transfer and acquire assigned amount units. International emission trading is the only flexible mechanism without a formal requirement for emissions reduction to justify a transaction, which means that countries can allocate IET transaction proceeds without restrictions. Governments can authorize companies to trade assigned amount units.

45. Ukraine has an AAU allocation, which qualifies it to participate in joint implementation and international emissions trading if it complies with the Kyoto Protocol eligibility requirements. Meeting these requirements will allow Ukraine as

¹⁶ Law "On Ratification of the United Nations Framework Convention on Climate Change", October 29, 1996.

¹⁷ Law "On Ratification of Kyoto Protocol to the United Nations Framework Convention on Climate Change", February 4, 2004.

¹⁸ Law "On Adoption of the Constitution of Ukraine and Its Enactment", June 28, 1996, and Law "On Amendments to the Constitution of Ukraine", December 8, 2004.

¹⁹ Law of Ukraine "On International Treaties of Ukraine", June 29, 2004.

an Annex-1 (“industrialized”) Party to transfer assigned amount units to another Annex-1 Party to meet its contractual obligations under an AAU transaction.

46. If Ukraine continues to allocate sufficient political priority, the country is on track to achieve eligibility under Article 17 of the Kyoto Protocol by the end of 2006. Implementation of the trading infrastructure is well advanced and Ukraine has indicated its intention to submit an Initial Report by the end of 2006. It is advisable that Ukraine submit its initial report as soon as possible to avoid being disadvantaged by the capacity of the UNFCCC to review reports in a timely manner. However, relying on nationally developed software rather than procuring one of the standardized and tested registry systems constitutes a risk for Ukraine and counterparties that rely on the functioning of the Ukrainian registry. Ukraine’s compliance with eligibility criteria is discussed in Annex A.

47. Ukraine must not only achieve but maintain its eligibility for international emission trading during the first commitment period. Eligibility requirements for participation in Article 17 transactions must be met when an AAU transfer occurs, which poses additional risk for AAU transactions. In practice this means that AAU-based Green Investment Scheme and underlying contracts need to specify arrangements in case a country becomes ineligible to transfer assigned amount units to the recipients’ accounts.²⁰ To maintain its eligibility Ukraine will need to allocate resources and demonstrate that it will continue to maintain the institutions created through the current internationally funded programs.

INSTITUTIONAL FRAMEWORK—REGULATING AAU TRADING AND GIS

48. The Cabinet of Ministers passed the *National Plan for Compliance with the UN Framework Convention on Climate Change and the Kyoto Protocol* on August 18, 2005 (Decree No. 346-p) which establishes an inter-government commission to comply with Ukraine’s international obligations and passes Ukraine’s National Compliance Program.

49. On September 12, 2005 President Yuschenko signed a Presidential Decree (No. 1239/2005)²¹ which confirmed the appointment of the Ministry of Environmental Protection as coordinator of measures to implement the Kyoto Protocol and mandates the Cabinet of Ministers to establish a procedure to coordinate compliance with the Protocol.

²⁰ An analysis of the extent to which Ukraine meets Article 17 participation agreements is based on the following research work:

<http://www.oecd.org/dataoecd/46/47/21022503.pdf> [Ukraine’s institutional capacity];

<http://www.oecd.org/dataoecd/5/40/2467141.pdf> [inventories, registries].

²¹ Based on Article 106 of the Constitution, which says, “the President can issue mandatory decrees and regulations on the basis of the Constitution and Ukrainian laws”.

LEGAL STEPS TO AAU TRADING

50. The unique nature of AAU assets sets them apart from other assets explicitly covered by existing Ukrainian laws. To what extent does existing legislation cover the transfer of assigned amount units? Which government entity should be authorized to execute an AAU transaction?

51. Domestic legislation is needed to define and clarify the authority to execute AAU trades and establish GIS.

52. For simple transactions involving only sovereign parties, executive authority of the Cabinet would be sufficient to conduct transactions involving transfer of AAUs. Such pilot transactions would be based on an agreement with one or several sovereign buyers. Such transactions could be undertaken without a dedicated emissions trading law.

53. A formal law regulating a GIS is needed for any programmatic approach to emissions trading. This is particularly true when private beneficiaries are involved and new administrative functions are required. A formal law would establish the Green Investment Scheme legally, define its objectives, specify how transaction proceeds would be disbursed and to which programs, outline the process for verifying results and reporting, and commit the Government to transfer assigned amount units to buyers. If Ukraine decides to authorize private entities to hold and transfer assigned amount units, it would also need to pass a law to authorize trades, which would support earmarking funding for multi-year greening programs.

54. Until a law is passed the first GIS transactions could be implemented through government decrees, a process that is not uncommon in Ukraine. While the draft law on joint implementation was in the legislative process, Ukraine based legislative action regarding joint implementation on Government resolutions. Executive resolutions on interim procedures could facilitate the implementation of AAU pilot transactions and regulate the establishment of a Green Investment Scheme, while a formal law is being processed.²²

55. To engage in AAU transactions, Ukraine must take the following steps, which could be completed in a few months.

- ***Prepare Cabinet of Ministers draft resolution.*** Ministry of Environmental Protection should prepare a draft decree for managing national AAU assets and participation in International Emission Trading that specifies greening criteria, and responsibilities and principles for negotiating and concluding pilot sales up to an established volume of assigned amount units.

²² Executive instruments, such as Presidential Decrees or Decisions of the Cabinet of Ministers, are widely used legal instruments; in similar circumstances many Western European countries would require formal laws. Decrees and laws, or the authority to adopt them, appear to be challenged rarely in courts.

- *Adopt resolution under Cabinet of Ministers* to prepare to implement pilot transactions.
- *Allocate responsibilities.*
- *Design a pilot sale and start negotiations with buyers.*

56. Next steps are the following:

- *Evaluate results from pilot.* Pilot sale would allow Ukraine to test the institutional framework, review state investment rules, and develop a comprehensive institutional model and regulatory framework for Green Investment Scheme. Results could tip the balance in favor of establishing programmatic Green Investment Scheme.
- *Prepare GIS law and regulations.* Implementing pilot transactions will reveal where private interests are affected and require legislation.
- *Implement a full Green Investment Scheme.* (within 1-year lead time).

MANAGING PUBLIC FUNDS

57. Regulations on use of the proceeds from the sale of state assets need to be taken into account when planning and structuring a Green Investment Scheme because assigned amount units are a state asset. Ukrainian law treats sale proceeds as receipts of the budget,²³ regulated in particular by the Annual Budget Law, which restricts state investments, and unfair state aid.

58. Similarly, the deployment of AAU sale proceeds must comply with the Budget Code, which controls distribution of budgetary funds, including *inter alia* that funds shall be used for envisaged purposes only; budget programs shall be financed within established limits;²⁴ only approved budget programs shall be financed;²⁵ and funding shall comply with public procurement rules.²⁶

59. *State investment.* If public investments are made by state bodies “*at the expense of monetary funds of budgets*”, these funds may be deemed as state investment activity of national significance and subjected to mandatory requirements.²⁷ Parliamentary approval may be required for such investments and for the volume of state investments at the expense of the Budget.²⁸ Ukraine’s Ministry of Justice must confirm whether this regulation applies to a Green Investment Scheme, in which case parliamentary approval would be needed for GIS scheme investments.

²³ Para.1 of Part 1 of Article 29 of the Budget Code of Ukraine, June 21, 2001, No. 2542-III, as amended.

²⁴ Payments at the expense of a special budget fund shall be made within funds received by such fund for respective purpose. Also, exact limits in Ukrainian Currency Hryvnia (UAH) are established for each year by the Budget Law.

²⁵ A budget program is a systematic list of measures directed to a sole purpose and assignments that are proposed and carried out by a manager of budget funds, detailed by the Budget Law.

²⁶ Public procurement rules shall be applied to the purchase of goods, works, and services with state funds. If a special Budget fund is deemed to constitute state funds, the public procurement rules shall be applied.

²⁷ Article 2 of the Law of Ukraine "On Investment Activity", September 18, 1991, No. 1560-XII, as amended.

²⁸ Article 13 of the Law of Ukraine “On Investment Activity”, September 18, 1991, No. 1560-XII, as amended.

60. *State aid and competition law.* The GIS investments that benefit private sector companies will be covered by state aid and competition law, which currently prohibits providing state funds to business because it might distort competition.²⁹ However the Commercial Code and other laws allow Government to establish or remove business categories covered by the law;³⁰ for example, the Commercial Code permits state aid to projects of national significance.³¹ Ukrainian legal advisors confirmed that these regulations are unlikely to impede GIS implementation.

61. State aid and competition law is changing as competition policy is aligned comprehensively with EU practice. This has two implications for Ukraine: First, legislative developments should be monitored to ensure continued GIS compliance, and second, when designing a Green Investment Scheme, Ukraine could take EU competition law principles into consideration. This would enhance GIS acceptability with AAU buyers and protect a Green Investment Scheme against future tightening in state aid and competition law. Ukraine has yet to reinforce the political independence of the control of monopolies and state aid has still to be implemented.³²

AAU SALES CONTRACTS

62. The first AAU sales contracts will likely be between sovereign parties. Ukraine has several options to approach a sales contract:

- Sign a treaty.
- Sign an agreement under private international law.
- Allocate AAUs to the private sector.

63. *Treaty.* Governments and states can sign and ratify an agreement between themselves—a treaty—governed by public international law. Approval and ratification of a treaty could be simplified if there is an existing law that delegates authority to negotiate and approve agreements to a Ministry or the Cabinet of Ministers.

64. The advantage of a treaty is that once ratified it assumes the status of a law, which means it will survive changing governments and require parliamentary acts to be abolished or changed. A treaty could establish the basis of a Green Investment Scheme and lend stability by defining ground rules. The ratification procedure would likely generate significant publicity, and once ratified the agreement is likely to be supported. The disadvantage is that ratifying international agreements is a cumbersome process that could take months or years.

²⁹ Article 15 of the Law of Ukraine "On Protection of Economic Competition", January 11, 2001, No. 2210-III.

³⁰ Article 12 of the Commercial Code.

³¹ Article 26 of the Commercial Code.

³² Lioli Ioulia, *Ukraine in a Euro-Atlantic Path: Accession in WTO and the Upcoming Trade Relations with the EU* (Hellenic Center for European Studies, May 2006).
http://www.ekem.gr/archives/2006/05/ukraine_in_a_eu.html (June 2006).

65. *An agreement under private international law.* A second option would be for the two governments—authorized legal entities (such as Ministries or State Agencies) of both states—to sign an agreement under private international law, and parties select which jurisdiction applies to the to the contract conclusion, interpretation, and enforcement.

66. Agreements under private international law are flexible and can be concluded quickly, for example by using UNIDROIT's standardized contract. Their main disadvantage is that subsequent governments can terminate them easily because they lack "law" status. However, breach of contract could still incur arbitration expenses, which could provide a deterrent.

67. Government agencies need clear legal authority to enter into an AAU sales agreement; as yet no law or executive ruling delegates this to a Ukrainian agency.

68. Therefore the best option for Ukraine to establish a Green Investment Scheme is to legally adopt a GIS concept and framework and authorize a government entity to sign agreements. Then individual transactions can be governed by private international law without jeopardizing sellers' and buyers' rights.

69. *Allocating AAUs to the private sector.* An alternative is to allocate assigned amount units directly to private project sponsors, then Ukraine avoids the difficulties and delays of negotiating a treaty; the Government would not transfer assigned amount units to other states, but would authorize private entities to do so.

SUMMARY

70. Domestic legislation is needed to define and clarify the authority to execute AAU trades and establish GIS. A programmatic and long-term GIS involving private beneficiaries and new administrative functions would require the establishment of a formal law. However, for simple transactions involving only sovereign parties, Ukraine's executive authority would be sufficient to conduct transactions involving transfer of AAUs. GIS could be implemented through government decrees until a formal law is passed; the Government chose a similar path for Joint Implementation.

71. A GIS should be established with due regard to budget, state aid and competition law.

72. The first AAU sales contracts will likely be between sovereign parties. If Ukraine legally adopts a GIS concept and framework and authorizes a government entity to sign agreements then individual transactions can be governed by private international law without jeopardizing sellers' and buyers' rights. This is likely to be quicker than entering into a treat under public international law.

Section 4. Feasible AAU Transaction Structures

This section describes the main features of a GIS transaction, analyses the risks and benefits associated with different structure, summarizes transaction structures, and looks at sales processes.

73. Before engaging in an AAU transaction Ukraine will have to weigh the risks and benefits of trading a commodity with the following unusual characteristics:

- Regulatory asset that exists in and depends on a framework of international law, political will, and acceptance
- Will not exist until 2008
- Can be transferred only within an established registry system
- Traders can gain and lose eligibility to transfer assigned amount units
- Uncertain market and value for assigned amount units.

These factors will influence Ukraine's AAU marketing strategy; the Government must decide whether it will engage in a transaction, when, and at what volume of sales and delivery and "greening" allocation. Ukraine will have to devise a strategy to select buyers and determine a pricing mechanism.

SALES BEFORE AND AFTER MEETING IET ELIGIBILITY REQUIREMENTS

74. Since AAUs cannot be transferred until 2008, Ukraine could decide to enter the market now under a forward contract or at a future date, once eligible, on the spot market. A comparison of forward and spot trades is provided in Annex C.

75. This report has considered a price range between €1 and €10 per AAU – reflecting the many uncertainties in the carbon market including post 2012 obligations, the fact that the market is in its infancy, the small demand and number of buyers and the fact that AAUs cannot be used for private sector compliance in the EU ETS. Most risks can be addressed through establishing a credible and transparent GIS, contractual terms, provision of guarantees, purchase of insurance and so forth.

76. For the foregoing reasons as well as the fact that a number of EITs (e.g. Romania, Bulgaria, Slovakia and Latvia) are already actively discussing AAU trading with potential buyers of AAU this report recommends that Ukraine take an early entry into the market through forward contract approach. A forward sale would establish Ukraine in the AAU market, generate further emission reductions, and share or reduce transaction risks. Early sales by Ukraine could later be rolled into a broader Green Investment Scheme covering various sectors.

77. A forward sale involves trading assigned amount units with a future delivery date. It carries a higher risk than a spot trade and the unit price is typically discounted. Ukraine could transact forward sales for future delivery of assigned amount units and/or greening activities. The actual transfer of assigned amount units would be possible only after countries fulfill the International Emission Trading eligibility requirements—expected at the earliest in 2008. Payment could be linked to

delivery of assigned amount units, to greening activity completion, or for a lower price, to future greening.

78. *Forward sales before 2008.* Several options exist for structuring forward sales of assigned amount units depending on payment timing and greening activity, including the following:

- **Option 1.** *Advance payment for assigned amount units at the time of contract execution.* Greening and transfer of assigned amount units to occur as soon as technically possible. Buyers will likely discount the price heavily to reflect risks that Ukraine might not transfer assigned amount units or might not green assigned amount units. The risk of Ukraine's non-performance will be considered very high for any buyer and insurance against risks may not be available or too costly.
- **Option 2.** *Payment on delivery of assigned amount units, but before greening is delivered.* Buyers may prefer to pay on delivery of assigned amount units. The risk that the greening activities will not occur is shared by buyer and Ukraine.
- **Option 3.** *Payment on delivery of assigned amount units and greening activities.* This limits buyers' delivery and greening risk but delays the flow of funds to Ukraine until after greening, which may necessitate bridge financing.
- **Option 4.** *Assigned amount units are delivered in installments followed by partial payment and partial performance of greening activities, but assigned amount units are delivered prior to the full completion of a greening activity.* This is a variation of Option 2. Payments are made against negotiated milestones but before greening is complete.

79. Interested and eligible private sector AAU buyers are likely to discount heavily for delivery risk (Option 1). They may assume the greening risk (Option 2), but Option 3, which minimizes their risk, would likely be the preferred choice. Government buyers are likely less risk-averse than private entities. However, even buyers in government-to-government transfers would be unlikely to advance funds without a delivery or repayment guarantee.

80. Before 2008, while the system is new and untested, Option 4 appears best able to respond to market uncertainties, maximizing shared risk in the first government-to-government transactions. Ukraine and the AAU buyer could devise a contract that included a payment schedule linked to greening activities, dates of completion, and finally, AAU transfers. To be attractive to Ukraine, such a transaction could be structured to include a partial advance payment. The milestones could be discrete activities or linked to implementing the Green Investment Scheme,³³ which would control payment and, as soon as technically possible, AAU releases. Whereas these approaches are adequate for pilot transactions, these arrangements should not

³³ The U.S. Clean Air Act State Implementation Plan sets out a similar "reasonable progress" requirement. The U.S. Environmental Protection Agency carries out periodic reviews to ensure there are both the degree of progress and rate of progress for States to meet final target deadlines.

dominate Ukraine's AAU trading strategy as 2008 approaches and the delivery risks diminish.

81. *Sales after eligibility.* Once Ukraine is eligible for international emission trading and international trading infrastructure is in place—expected in 2008—AAU delivery risk will be very low. If a Green Investment Scheme has been tested and is being implemented, the need for upfront payments would diminish because regular AAU transfers and greening activities should ensure cash flow for new GIS activities and management.

82. Once eligible, Ukraine can begin spot market AAU transactions under which it agrees that (a) sales proceeds will be committed to greening or (b) if greening has occurred, that AAU sales will be linked to completed greening activities.

83. After 2008, Ukraine can also sell assigned amount units under long-term flexible- and/or fixed-price contracts with commitments to deliver assigned amount units for several years. Typically the contracts would establish dates for AAU delivery to the buyer, together with evidence that proceeds have been used for agreed purposes and payments would follow AAU deliveries. These extended off-take agreements could be an important element of a Green Investment Scheme because they guarantee funding continuity and signal commitment.

84. A more sophisticated trading system such as a stock exchange would require enforcement of greening commitments, independent reporting, and possibly an independent guarantee of greening. The Ukrainian Climate Change Center "securitization" model describes such a mechanism (Annex D). A Green Investment Scheme could adopt this model once there is a liquid market for assigned amount units, and Ukraine has established a strong institutional framework, credibility, and reliability as an AAU seller. The market may not be ready for such an approach in the first commitment period of the Kyoto Protocol.

APPROACHING AN AAU TRANSACTION

85. AAU transactions could be bilateral, multilateral, or syndicated. Alternatively, Ukraine could issue assigned amount units or emission reduction units directly to project owners.

86. *Bilateral.* The simplest approach for first transactions would be a bilateral agreement between Ukraine and each buyer with individual contracts and greening arrangements. Ukraine could also trade bilaterally using standardized contracts, which lowers transaction costs but is unlikely to be feasible until standard practices are established in AAU trading and Green Investment Schemes. Ukraine should avoid proliferating contract types or conditions with different buyers, which could increase contract underperformance risks if greening activities become unmanageable.

87. *Multilateral.* Under a multilateral arrangement Ukraine could decide to sell assigned amount units to a few selected government buyers and negotiate one institutional arrangement and contract. Larger transaction volumes with elaborate greening commitments may require an institutional approach to develop programs and projects, disburse AAU sales proceeds, and oversee greening activities. Buyer participation would facilitate support for larger projects and improve risk management, and Ukraine would likely encourage buyers to accept standardized contracts and arrangements.

88. *Syndicating.* Under a syndicating arrangement Ukraine could contract with intermediaries representing Ukraine or buyer governments; for example foreign private Banks offer these services to Eastern European governments. For a margin or a fee through syndication from the seller or buyer or both, the intermediary appraises Green Investment Scheme transactions and programs, conducts due diligence, and monitors GIS performance. When evaluating the latter model Ukraine needs to consider whether it wishes to entrust foreign private entities with a sales mandate. Alternatively Ukraine may assess the interest of local banks to lend against the security of a government backed AAU contract.³⁴

89. *Allocating AAUs to the private sector.* Alternatively Ukraine could allocate assigned amount units or emission reduction units to greening project owners who could negotiate directly with buyers. New Zealand in two separate tenders in 2003 and 2004 promised to issue AAUs or ERUs to individual projects that will reduce emissions. Rather than the government selling the AAUs under either a multilateral or bilateral GIS, the recipients of AAUs were free to negotiate their sale with buyers directly. In this scenario a Green Investment Scheme would identify project criteria, select and appraise projects, monitor greening activities, and issue assigned amount units/emission reduction units to project sponsors upon completion of greening activities. The risk of this approach is that it may be difficult for project owners to sell small quantities of assigned amount units to government buyers for a fair price. Since supply would be highly fragmented, project owners would be more likely to sell to private sector entities interested in AAU transactions, such as speculators or the Japanese private sector. Annex E describes the New Zealand example in more detail.

90. The first transactions are likely to be government-to-government. Only Japan has authorized its private sector to hold AAUs - and to be restricted to a small number of buyers. Spain, Italy and Japan seem particularly promising candidates to

³⁴ Most proposals from private Banks combine a loan with a mandate to sell or manage AAUs on behalf of the host country. Under this structure the private Bank provides advance funding to the host country at a very cheap base rate. The funding is secured by an agreed number of AAUs. Both the AAUs and the funds are placed in an escrow account, and the seller and buyer agree on a range of projects that will receive funds. Alternately the private Bank advances funds to the seller and is repaid by the buyer over time. The private Bank uses the government-government transaction as collateral for its loan. Often the private entities also offer to sell AAUs. If they sell them above an agreed threshold price then the private Bank takes a fee; an agreed percentage of the difference between the sales price and the agreed threshold. If the AAUs cannot be sold at or above the agreed threshold then the loan becomes repayable.

market Ukraine's AAUs because of their expected difficulties in meeting their Kyoto targets. In this scenario Ukraine may consider negotiating an institutional arrangement and contract individually with each (government) buyer.

BUYER SELECTION AND PRICE DISCOVERY

91. There is currently no AAU market and no market price. Ukraine can increase AAU transaction prices by lowering the risk of delivery or through marketing, selling, and negotiating confidently; irrespective of the form of sale. This will help to minimize discounts and yield better terms.

92. Buyer selection and price setting are interlinked and there are several forms of sales:

- *One-on-one negotiations.* This simplest form of sale consists of individually negotiated agreements that accommodate each situation and relationship, typical of government-to-government negotiations.
- *Invitation to tender.* (negotiated procedure) Ukraine can invite several buyers to submit proposals, select a buyer and negotiate the complex contractual issues for which formulaic tender submission is poorly adapted.
- *Auction.* This creates the strongest sense of buyer competition and transparency but it may not be appropriate for the complexity of assigned amount units linked to greening commitments, particularly in the early days of the market. The limited number of buyers also undermines the efficiency of an auction.
- *Public offering.* This regulated sale can reach a broad universe of buyers and inspire confidence, but the complexity of a public offering requires a well-understood instrument which may make this impractical for the market.
- *Tender for projects.* This bottom-up approach allows Ukraine to select projects according to published criteria and allocate assigned amount units; project owners can then sell the assigned amount units if they successfully implement the project.

93. The form of sale should be based on (a) volume of assigned amount units on offer; (b) design of products from AAU transactions; (c) number of buyers; and (d) types of buyers (governments, authorized private entities). Effective sales require knowledgeable buyers; therefore it would be useful for Ukraine to send out advance invitations to auction (or tender) containing details of the proposed transaction, including greening information, and a draft contract.

94. Ukraine should check potential buyers' ability to participate in the selected sales process, particularly since most AAU demand will likely come from a few governments such as Japan, Spain, and Italy. Ukraine may consider inviting governments for coordinated bilateral talks to determine if their domestic laws prevent them from participate in certain sales processes.

95. Multilateral negotiations are a variation of one-on-one contracts that could be suitable if there are few buyers for Ukraine's assigned amount units. Buyers acting in syndicate with other countries may transact more confidently, encourage each other, and enjoy a sense that the process is transparent.

STRENGTHENING THE TERMS OF SALE

96. Ukraine's strategy should be guided by risk mitigation to strengthen the terms of sale for its AAUs. In assessing transaction risks, sellers will likely consider *inter alia* the GIS governance structure, management, and Ukraine's compliance with Kyoto obligations. A commitment to greening assigned amount units is in itself a mechanism for improving terms of sale.

97. Identifying and managing risks is crucial for AAU trading and successful GIS. Both Ukraine and its counterparts face risks; a buyer who perceives greater risks will seek to discount AAU prices and a seller with greater risk will want to raise the floor price (Annex F presents and discusses key transaction risks).

98. Ukraine's main risks are the following:

- **Compliance risk.** Ukraine over commits to sell or transfer assigned amount units, for example due to inaccurate estimates of future emissions levels, or eligibility.
- **Greening risk.** The Government commits to delivering greened assigned amount units but proves unable to ensure that greening actually happens.
- **Market risk.** The market price of assigned amount units changes materially (the price falls before the government has sold).
- **Counterparty credit risk.** Ukraine sells assigned amount units to a counterpart who fails to make payment.

99. Risks faced by a buyer include the following:

- **Delivery risk.** Ukraine fails to deliver the contracted assigned amount units, for example because it has overestimated its supply, because it no longer wishes to honor the contract, because of dispute, eligibility, etc.
- **Greening risk.** Commitments to greening are not fulfilled, which erodes the AAU value to the buyer.
- **Market risk.** The market price of assigned amount unit changes materially, for example, the price increases prior to government purchase.
- **Political risk.** The agreed transactions are politically unacceptable because taxpayers are not convinced by greening commitments.

100. Most of these risks are manageable if a credible greening scheme is in place. Otherwise they can be addressed through contractual terms, guarantee provisions, insurance, and so forth.

ADVANCE PAYMENTS AND RISK MANAGEMENT

101. Ukraine will need resources to establish a Green Investment Scheme, including to:

- Identify project pipeline,
- Finance initial project documents,
- Provide upfront project financing,
- Provide bridge financing if Ukraine establishes Green Investment Scheme before it is eligible to transfer assigned amount units—prior to 2008 at the earliest.

102. To date AAU buyers have been reluctant to make upfront payments. Most GIS transactions payments from buyers will likely occur once assigned amount units have been transferred and/or once greening activities have been implemented, which means that Ukraine must raise upfront funds for GIS implementation. There are several options that Ukraine could consider:

- *Link transactions to Ukraine's securities market*—the Ukrainian Climate Change Centre has developed a “securitization” model to generate upfront revenue for greening activities, but this requires a mature and liquid market in assigned amount units and a strong institutional framework in Ukraine. See Annex D for details.
- *Seek mezzanine financing from commercial banks*—other Eastern European countries’ experience has shown that private sector banks are interested in offering mezzanine financing to cover the interval between GIS establishment and receipt of funds from AAU buyers. Ukraine could explore potential for private banks to advance funds to a Green Investment Scheme.
- *Obtain up-front payment from public or private AAU buyers*—sovereign buyers may be more likely to share Ukraine’s compliance risk. To limit their exposure governments and sovereign buyers can take resource to traditional means of international relations. Private financial institutions or multilateral lenders on the other hand might offer a forward sales contract (likely at a discount) or a loan secured by an AAU sales contract. The financier may be exposed to risks of non-delivery and require a Government guarantee, or may obtain insurance or guarantees to offset risks of advance payments not being recovered. Financiers could also reduce their risks by assigning AAU proceeds to an escrow account and funds would be transferred to Ukraine from this account only when milestones (such as meeting eligibility criteria) are achieved.

103. A Partial Risk Guarantee could be considered to mitigate delivery risk associated with the securities market or mezzanine financing. A number of multilateral political risk mitigation mechanisms are available to support private sector investments into emerging economies. Risk mitigation instruments available from the World Bank Group (the World Bank’s Partial Risk Guarantee and the MIGA guarantee) and from the EBRD are designed to assume political and government performance risks. While these guarantee instruments are similar in concept, there are institutional differences. However, these risk mitigation instruments could work together on a co-financing basis to provide a political risk coverage package. Such instruments need to be designed to cover risks related to the performance of the Government and Government-controlled entities.

THE AAU SALES CONTRACT

104. A contract between a seller and a buyer could include the following features:

Core contractual terms

- Volumes, vintages, and prices,
- A payment schedule, including milestones that trigger payments,
- An AAU delivery schedule or certain events that trigger the transfer obligation (such as the achievement of greening),
- Rules governing the transfer of assigned amount units,
- Default provisions and remedies,
- Reporting obligations.

Greening

- Greening obligations of the seller government, perhaps specifying descriptions of earmarked greening projects,
- Monitoring and verification of greening.

The contract might also include

- An option agreement on further purchases (call/put options),
- Price re-openers based on market triggers to account for fundamental changes in AAU prices.
- In case of a framework treaty between governments—the agreement to have private entities participating in the Green Investment Scheme,
- The possibility to expand the agreement in scope and time,
- Accounting provisions governing disclosure of GIS accounts to participants,
- The possibility to re-allocate funds among greening opportunities to expand successful operations.

SUMMARY

105. Ukraine's strategy for trading should be guided by risk mitigation to strengthen the terms of sale for its AAUs. The review has determined that most risks can be addressed through establishing a credible and transparent GIS, through contractual terms, provision of guarantees, purchase of insurance and so forth.

106. If Ukraine takes an early entry into the market through a forward contract approach the first transactions are likely to be government-to-government and to be restricted to a small number of buyers. In this scenario Ukraine may consider negotiating an institutional arrangement and contract individually with each (government) buyer.

107. A forward contract where AAUs are delivered in installments, payments follow AAU delivery and partial performance of greening, but remaining AAUs are delivered prior to the full completion of greening seems to offer the most balanced approach for Ukraine. Ukraine may also decide to negotiate a partial advance payment to secure funding for the GIS and project implementation.

Section 5. Designing a Green Investment Scheme

This section addresses how AAU trading and Green Investment Schemes might be organized and administered, and what institutions and bodies may need to be involved.

108. A Green Investment Scheme is a vehicle to channel AAU sales proceeds into measures for reducing GHG emissions, or creating broader environmental benefits. Sellers commit to such measures to ensure the environmental integrity of the Kyoto Protocol and to secure better terms of sale, but this commitment is voluntary since greening is not defined under the Kyoto Protocol.

109. In its simplest form, a Green Investment Scheme could be one project partly funded from AAU transaction proceeds. The AAU transaction would include assurances to buyers that AAU proceeds would be used to achieve agreed environmental benefits. For example, Ukraine could sell one million assigned amount units for €5 million, proceeds that it would agree to use to finance energy efficiency improvements to public housing.

110. In its most sophisticated form, a Green Investment Scheme could involve many institutions and sectors; it could regularly auction assigned amount units to buyers under standard terms, and under a full sales and trading strategy; it could manage a portfolio of projects and programs; it could influence climate change policy across the economy. For example, if Ukraine raises tens of millions of Euros through AAU transactions and makes numerous and diverse greening commitments, it will require a systematic approach.

111. Between these two extremes are many permutations. The size and nature of the institutions that Ukraine builds around a Green Investment Scheme will depend on the volume of proceeds raised from AAU sales, the duration of greening commitments, and above all, the level of political priority for these issues. Ukraine should establish a Green Investment Scheme that responds to the level of AAU market demands, neither over nor under investing.

112. Sovereign buyers are looking for well structured proposals for AAU purchases. A GIS should be designed to be consistent with government policy, to manage trading and greening, and have sound procurement, financial and environmental monitoring, and reporting mechanisms.

113. A GIS needs to meet a number of potentially conflicting requirements:

- Buyers' preference to earmark funds to assure that AAU proceeds go to agreed projects and programs or greening activities (Annex G).
- A requirement to link AAU transfers and payments that occur during the first commitment period to greening activities that are likely to occur during and beyond this period.
- Flexible budgeting and investment since greening activities will likely be linked to multi-year projects and programs.

114. This report examines two main vehicles for structuring a GIS within the Ukrainian domestic legal framework:

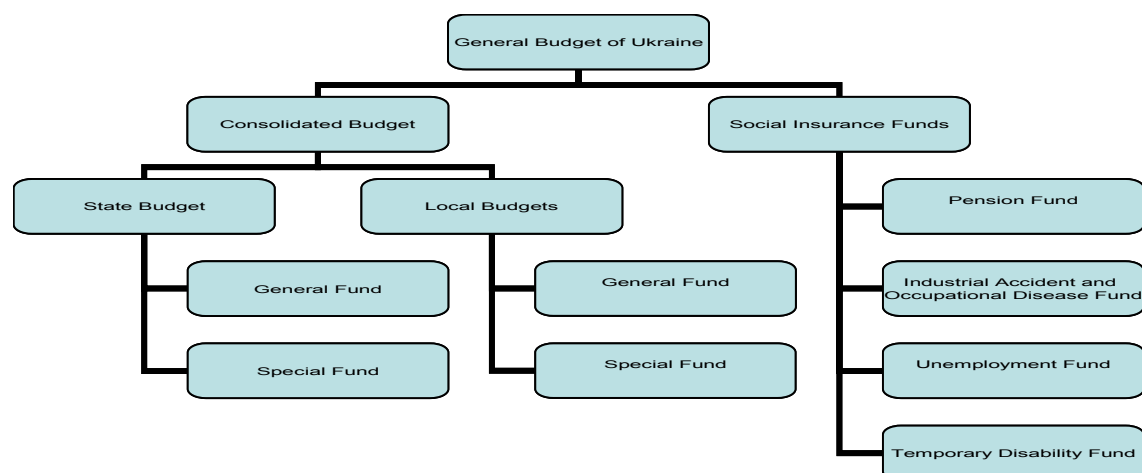
- As a Special Fund in the Ukrainian budget.
- As an extra budgetary fund.

These are discussed below together with a proposed organizational structure for a full GIS and funding considerations.

GIS AS SPECIAL FUND IN THE UKRAINIAN BUDGET

115. A GIS could be a targeted program in the Special Fund of the budget. Ukraine created the Special Fund during budget consolidation reform in 2001 (see Figure 2) to house government investment projects that require earmarking.³⁵ Since GIS funds require earmarking, the Special Fund would allow them to be channeled through the budget without undermining the budget consolidation process.

116. Existing budget laws may make it difficult to fully safeguard AAU proceeds over a multi-year timeframe because Ukraine’s fiscal system is based on annual budget allocations, creating difficulties for multi-year greening commitments. Therefore the Special Fund is risky for safeguarding AAU proceeds for multi-year GIS projects. Although the budget code allows for multi-year projects under the Special Fund, in practice this has been problematic for targeted Government programs (which are established by law on a multi-year basis). Funding shortages have led to completion delays or incomplete projects.



Source: Ukraine-Public Finance Review (2006).

Note: Ukraine’s legislation does not have a “General Government Budget” but two separate branches— the “Consolidated Budget” and the off-budget Social Insurance Funds.

³⁵ The Special Fund is particularly linked to financing of capital expenditures, which accounted for 43 percent of total special fund expenditures in 2005, and 67 percent of total capital spending. Special budget fund expenditures are financed by earmarked revenue sources defined by legislation. In 2005 over 70 percent of special fund revenues consisted of (a) public services user fees (39.2 percent), (b) excise charges for domestically produced and imported oil products and vehicles (8 percent), (c) extra charges to the tariff for electricity and heating (6.3 percent), (d) duties on foreign exchange buying-selling operations (7.7 percent), and (e) receipts from sales of capital assets.

Box 1. Earmarking — Main advantages and disadvantages

Earmarking refers to the practice of assigning revenue from specific taxes or groups of taxes/charges to finance specific government services. Environmental authorities have often advocated earmarking of revenue from environmentally-related taxes/charges for financing environmental projects either through general budgets or through public environmental funds, controlled by the Ministries of Environment.

It is widely acknowledged that earmarking limits flexibility and thus, potentially, the efficient allocation of resources to the most socially-needed uses. Also, accumulation of earmarked schemes can lead to budget fragmentation which in some cases may become difficult to manage. However, under certain conditions, earmarking is perceived as a price worth paying for having predictable financing for priority environmental measures that would otherwise have not been implemented. Also, earmarking exhibits a strong revenue-benefit link which helps increase acceptability of new taxes/charges thus generating additional revenue for government spending.

Economists usually argue against earmarking while Ministries of Finance are often concerned about risks of managing disintegrated budgets. The “*OECD Council Recommendations on Good Practices of Public Environmental Expenditure Management*” also stipulates that as a general rule, earmarking of public expenditures is discouraged as it impedes the efficient allocation of resources to socially-optimal uses. However, if deemed indispensable, earmarking is considered acceptable, but should be adequately designed and limited to specific periods of time necessary to achieve the stated objectives of the expenditure program. The advantages and disadvantages of earmarking call for a case-by-case decision with regard to proposed individual earmarked schemes. Some of the major pros and cons of earmarking are listed below:

Earmarking: Pros

- Politically popular, as it increases acceptability of new taxes/charges through a stronger revenue-benefit link;
- Transparency of revenue use; through increased taxpayers’ knowledge of how their taxes are spent;
- Can be useful for funding special urgent environmental programmes.

Earmarking: Cons

- Transparency
- Leads to inefficient patterns of public expenditures;
- May undermine comprehensive public budget management;
- Introduces rigidities which impede adaptation to changing priorities;
- Can lead to over-investment and unnecessary spending;
- Tends to continue beyond the timeframe necessary to achieve the programme’s stated objectives (vested interests of fund managers and beneficiaries);
- The financing and incentive functions of taxes/charges are blurred.

Source: “Council Recommendation on Good Practices of Public Environmental Expenditure Management,” OECD, Paris, ENV/EPOC/WPNEP/(2005)1

Figure 2. Organizational structure of the general government budget of Ukraine

117. The World Bank and Ukrainian authorities are working to improve multi-year budgeting and thereby mitigate this risk. The planned Public Finance Management Reform project financed by the World Bank will provide technical assistance to the Ministry of Finance to develop multi-year budgeting. Therefore improvements may be realized before GIS fund flows take place, in particular if Ukraine opts for spot rather than forward sales of assigned amount units.

118. If the Green Investment Scheme is a targeted budget program under the Special Fund, it would have no autonomous legal status; instead the Ministry of Finance would hold AAU proceeds in a reserve account and allocate them annually to GIS management to finance agreed greening activities. However, these arrangements would not preclude contracting fund management to private entities under a trust agreement.

119. To ensure sound project execution of the GIS through the Special Fund the following actions would be required:

- Ukraine sets an account/code solely for the GIS in the Special Fund.
- The multi-year nature of the Green Investment Scheme (and the account established for that purpose in the Special Fund) and the commitments for funding and use through the Special Fund are embedded in the legal agreements.
- Establish a procurement mechanism—treasury and audit functions are sound but public procurement holds significant fiduciary risks that must be addressed outside government systems.

GIS AS AN EXTRA-BUDGETARY FUND

120. Many AAU buyers may prefer an independent structure such as a separate legal fund that safeguards AAU proceeds by not mingling them with Ukraine’s state budget. A Green Investment Scheme could be constituted as one or more independent legal entities or as an extra-budgetary fund³⁶ to channel GIS proceeds to greening activities.

121. Of the existing structures, the State Environment Protection Funds (the “Environment Fund”) could potentially provide a governance and management structure for a Green Investment Scheme.

³⁶ The Bulgaria Energy Efficiency Fund (BEEF) or the Romanian Fund for Energy Efficiency (FREE) serve as other examples of specially created publicly owned funds which provide investments in energy efficiency measures on a commercial basis. Applying the BEEF model to Ukraine, proceeds from AAU transactions would flow from the AAU buyer to the Government (the Ministry representing the Government) and under a separate agreement these proceeds would pass to a fund established for this purpose.

Box 2. Capacity of Ukraine's environmental funds

In 2001, the Danish consultancy COWI evaluated the capacity of oblast environmental funds (OEF) in Ukraine. Objective of the evaluation was to assist the Government of Ukraine in its attempt to streamline environmental funds by identifying a number of well performing funds which could be turned in to effective financial institutions. COWI evaluated the performance of the funds along their established capacity to fulfill their statutory functions. The main findings of the study:

The oblast environmental funds are weak institutions which lack a dedicated institutional or management structure. The funds are administered by the State Department of Environmental Protection which is the main State management body for the environment in all 24 oblasts.

1. *Legal capacity.* The statutes of the funds do often not specify priorities, making it unclear what steers the prioritization between environmental problems and activities.
2. *Organizational capacity.* The funds administrations have no formal management structure, dedicated offices and staff. The funds are mere budget lines without organizational structures in their own right. The awareness of the funds is limited.
3. *Project management capacity.* It is not common practice to use standard application forms and decision-making at project appears blurred.
4. *Financial capacity.* There is a gap between total revenues of the funds and the total expenditure, indicating that not all resources are allocated to environmental purposes.

COWI identified the Donetsk OEF, Zaporizie OEF and the environmental fund of the Crimean Autonomous Republic as the three most promising funds. These funds share the features that they are all located in regions with severe environmental problems; they have staff interested in the successful implementation of the funds; they have a relatively large share of investment projects in their portfolios, and they are relatively well funded.

Source: Ministry of Environment and Natural Resources, Ukraine & DANCEE, Ministry of Environment and Energy, Denmark, Capacity Screening of Oblast Environmental Funds in Ukraine, 2001.

122. Improved fiscal discipline³⁷ in Ukraine has led to significant revenue increases in the Environment Fund but this has not yet improved Fund implementation. Implementation of existing environmental funds in Ukraine is characterized by inefficiencies.³⁸ The budget passport does not always protect funds from reallocation among Ministry budgets, or dissipation among many management levels.³⁹

123. Consequently the Environment Fund is considered to fall short of trust necessary to convince AAU buyers to participate in a Ukrainian Green Investment Scheme. Extra-budgetary arrangements (e.g., an escrow account or extra-budgetary fund) also go against present public finance reforms, which aim to consolidate the budget. It is therefore not recommended that the GIS be implemented outside the general fiscal policy of Ukraine.

³⁷ *Ukraine, Public Expenditure Review (Phase I), Creating Fiscal Space for Growth* (World Bank, May 25, 2006); OECD, Performance Review of the State Environmental Protection Fund of Ukraine, unpublished draft, June 2006.

³⁸ For a review of local environmental funds: Ministry of Environmental Protection, Ukraine & DANCEE, Ministry of Environment and Energy, Denmark, Capacity Screening of Oblast Environmental Funds in Ukraine, 2001.

³⁹ The budgetary structure of the State Environmental Fund has been replicated at the regional (oblast) and local levels. There were a total of about 9 900 environmental funds in Ukraine in January 2005.

POTENTIAL ORGANIZATION OF A GIS

124. Initially AAU sales will probably be linked contractually to specific investment projects or programs. As the market develops, it may be desirable to loosen this link to appraise and implement greening activities in anticipation of future AAU sales and to sell assigned amount units (together with greening activities or commitments) when the market is strong. Weaker linkages will require stronger institutions and systems to ensure that AAU sales and greening activities remain connected.

125. With the above and budgetary considerations in mind a potential organizational structure of a full institutional Green Investment Scheme is presented with a management structure based on four pillars:

- Professional fund management by a Management unit;
- Fiscal management by a unit established in the National Bank;
- A Supervisory body to review priorities, strategies, effectiveness;
- An AAU Management unit supervising Ukraine's AAU compliance position.

This is shown in Figure 3. Roles and responsibilities are discussed below.

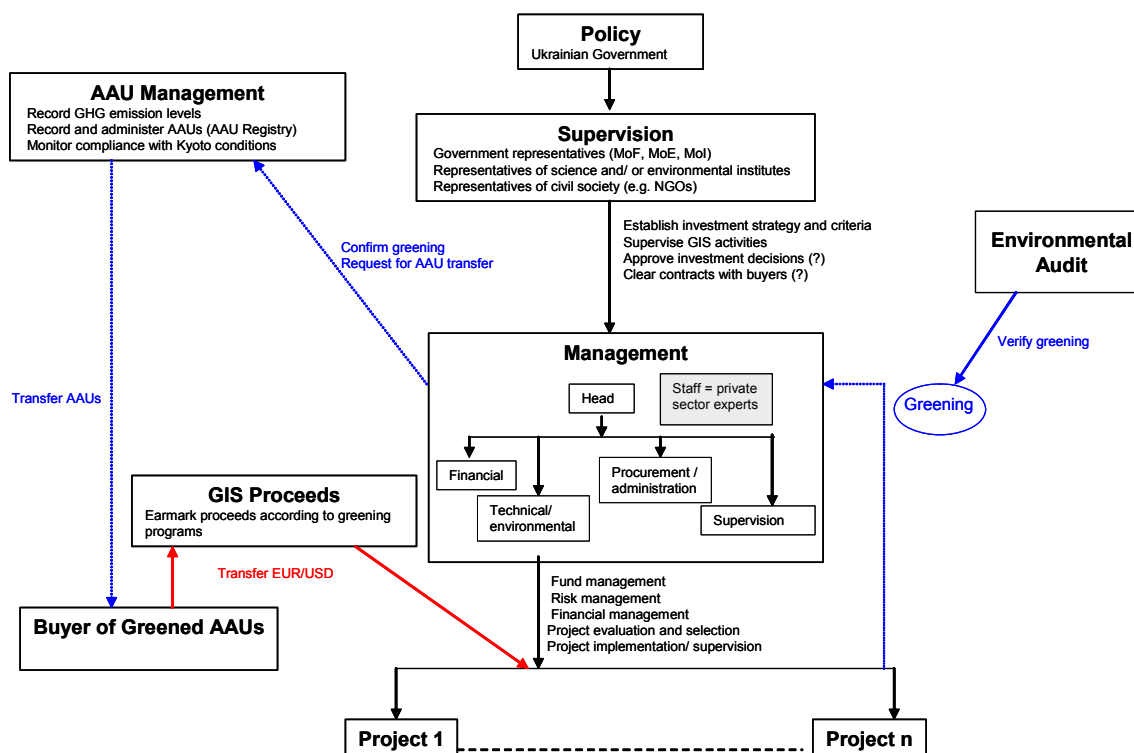


Figure 3. Potential organizational structure of a full institutional GIS

ESTABLISHING A CHARTER FOR THE GIS

126. Potential buyers have stressed concerns in discussions with the World Bank that AAU transactions, and GIS operations should be transparent and accountable. Some nongovernmental constituencies are concerned that Ukraine may lack capacity to use AAU sales proceeds efficiently.

127. Ukraine may wish to define qualitative principles that will underpin GIS design and operation and establish these in an initiating charter. For example, operating

according to principles rather than ad hoc; remaining transparent and open to public comment; maintaining independence from political interference. Such principles will establish credibility with buyers and stakeholders, which will boost economic prospects for AAU transactions, and increase political and social capital.

SETTING POLICY FOR TRADING AND GIS MANAGEMENT

128. Government policy must drive approaches to AAU trading, GIS design and management. Decisions on a range of issues relating to AAU transaction volumes and approval of trading counterparts; GIS organization and reporting; priorities for greening; third party approval for AAU fund and project management; must be consistent with other government policies. For example in energy, transport, housing, education, and foreign affairs.

129. Ukraine must first decide which body should be responsible for developing AAU trading policies and GIS management principles, and then how that body can ensure effective policy implementation. A GIS could handle significant sums of money, which means that policies on AAU trading and GIS management could affect Ukraine's budget, compliance with Kyoto commitments, and areas of society and the economy that receive GIS financing. This wide-ranging impact on the country suggests policy should be set at Government level, most likely through the Cabinet of Ministers.

SUPERVISION AND MANAGEMENT OF THE GIS

130. Good international practices show that funds typically consist of two governing bodies:

- Supervisory body that is responsible, among others, for establishing spending priorities, setting internal policies, approving the annual plan and budget, internal operating procedures and project portfolios.⁴⁰
- Management (executive) unit responsible for the daily operation of the fund such as project cycle management, financial management and external relations,

131. *Supervision of trading and GIS management.* It is essential that this state asset is well managed, policies are properly implemented, and desired outcomes are achieved. To be effective, a supervisory body must have sufficient authority to call to account the GIS management, including the right to recommend suspension or replacement; independence from political pressures, conflict-of-interest concerns, or undue influence; and funding and political support at the highest levels, to carry out its duties. Including individuals from public, private, and commercial entities in the supervisory body would contribute to the success, credibility, transparency and

⁴⁰ OECD, Performance Review of the State Environmental Protection Fund of Ukraine, Unpublished draft June 2006, p. 20.

accountability of the supervisory body.⁴¹ The Supervisory body should also be open to buyers' representatives, should they require so.

132. The Inter-ministerial Commission on Implementation of the UNFCCC exemplifies an existing inter-ministerial body that could fill the supervisory function; the Commission comprises vice-ministers, scientists, and public representatives and acts as a supervisory body for decisions related to the UNFCCC implementation.

133. *Management of AAU trading and GIS.* There are two main roles within the Management unit: trading and transfer of AAUs, and management of the GIS.

134. Ukraine must authorize a public body to take decisions on trading and transfer of assigned amount units until a sophisticated market develops with accredited private traders, authorized to market assigned amount units under established conditions on behalf of the Government. This would involve identifying and selecting buyers, and negotiating and executing sales agreements, activities that require decisions on the volume of assigned amount units traded and transfer terms and conditions.

135. A core management function is needed to manage the project pipeline and greening. It is recommended that a performance based contract, subject to periodic review and negotiation, be established between the responsible Ministry and the GIS manager to allow a transparent arms-length relationship between policy agencies and technical entities.

136. The GIS management function could be performed by the Ministry of Environmental Protection or coordinated by the Ministry of Finance with technical assistance from the Ministry of Environmental Protection and the Ministry of Economy. While embedding this unit in the existing infrastructure would reduce administrative costs it is important that the institutions are adequately funded and staffed to avoid the shortcomings of the State Environment Protection Fund.

137. Alternatively this role could be delegated to private entities, but Ukraine first needs to review its legal framework to ensure that private entities are authorized by formal law to implement sovereign functions.

138. The GIS management could be centralized or decentralized.

- *Centralized*—a large body of staff with a range of expertise would directly appraise and manage projects and programs.
- *Decentralized*—a core unit would recruit and supervise entities to manage individual greening activities—private fund management companies,

⁴¹ Arrangements well tested in the Polish EcoFund, which manages debt for environment swaps, can be used as an example of how outside sponsors can be engaged in oversight of the environmental expenditure program. Another example is the Bulgarian BEEF which is governed by a Board which oversees all operations of the fund and consists of representatives from different ministries as well as the private sector.

sector experts, or non-profit organizations, depending on the demands of the greening activities they manage.

The choice between these two options should be driven by pragmatic considerations related to administrative costs, capacity and track-record of existing institutions, readiness of different sectors to come up with realistic project pipelines.

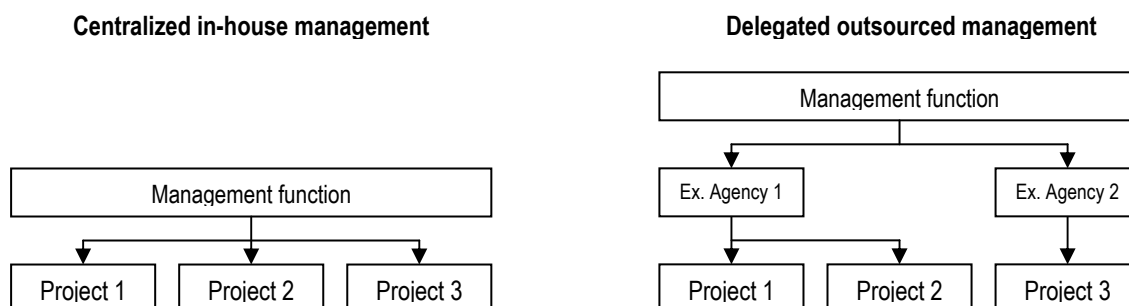


Figure 4. Possible management models

139. Appraisal and supervision of greening activities could be outsourced to the private sector without changes to the existing legal framework. Performance-based contracts could be established subject to periodic review and remuneration and based on a retainer fee plus performance incentives linked to investment returns or “greening” quotas.

140. **Monitoring and verification.** Buyers seek assurance that transaction proceeds are supporting greening activities and achieving environmental results.

141. A financial management function is required with full responsibility for exercising fiscal and fiduciary responsibilities to international standards, including monitoring fund flows, maintaining accounts, and reporting. Financial management and audit procedures could follow standard international reporting formats, and AAU buyer contracts would include agreements on these formats.

142. The Project Monitoring Unit (PMU) for International Credit Lines affiliated with the National Bank of Ukraine could be a suitable candidate for this function. The PMU ensures fiduciary and financial management of escrow accounts and financial reporting on a number of foreign credit lines. The PMU organizes tenders among local banks for management of foreign credit lines and supervises their performance. Over the years of its existence it has gained trust and respect nationally as well as internationally.

143. Ukraine could use existing environmental auditing companies and international firms accredited to validate JI projects to verify greening activities or other environmental benefits. Alternatively (and preferably in the long term), Ukraine could build local capacity in environmental compliance monitoring using technical expertise from private entities. Monitoring reports should be made public.

PAYING TO ESTABLISH AND OPERATE THE GIS

144. If the Green Investment Scheme is established as a targeted program under the Ukrainian budget law, the AAUs sales proceeds would be held by the Ministry of Finance in a special reserve account. The Ministry would allocate GIS administrative costs annually to GIS Management, the Supervisory Body, and AAU management functions. Annual allocations could be based on a multi-year, rolling business/implementation plan, subject to verification of achievements and results, and could include funds to cover administrative costs. To keep management costs low, such a system can be outsourced or be assigned to existing institutions. Dedicated institutions and functions should only be created when the market and AAU demand justifies the establishment of such institutions.

145. Costs to design and implement a GIS pilot transaction are estimated to be between US \$350,000 and US \$700,000 (external consultants and legal fees), which can be recovered under an advance payment.

SUMMARY

146. To provide assurance to buyers that AAU sale proceeds flow to agreed projects and programs and that greening takes place this report recommends that a GIS be established as a targeted program in the Special Fund of the Ukrainian budget with the multi-year nature of the program embedded in the legal agreements for the Fund. This would ensure the transparency of fund flow and be consistent with fiscal policy.

147. A generic organizational structure for a full GIS is further proposed with a professional manager engaged under a performance based contract to manage AAU trading and greening activities, and a supervisory body for oversight and fiduciary purposes. A decision to engage in GIS should not entail a burden on the budget since the GIS can be financed from the proceeds of the sale of AAUs.

Section 6. Use of Proceeds

This section looks at populations and economic sectors that could receive GIS support, mechanisms to distribute support, and criteria for prioritizing.

148. Green Investment Scheme proceeds can support investments in projects or programs that reduce GHGs or provide other environmental benefits, such as reduction in industrial pollutants. GIS proceeds can support other broader initiatives such as capacity building, policy change, or the administrative costs of the GIS itself.

UKRAINE'S GREENING POTENTIAL

149. Ukraine's overall greening potential depends on identifying GHG abatement or other environmental projects. Other considerations when evaluating greening opportunities include commercial feasibility, implementation and absorptive capacity, and for public sector projects, finding counterpart financing.

150. Annex H includes an indication of the greening potential in nine emission intensive sectors of the Ukrainian economy. It confirms that there is significant greening potential particularly in the fuel and energy, iron and steel, and heat and power sectors. It discusses barriers to greening and greening opportunities. Emissions from the extraction of fuels, their transport and processing are the largest contributors to GHG emissions in Ukraine.⁴² In financial terms, industry is contributing to the economy at the expense of agriculture implying a modal shift to more GHG intensive sectors.⁴³

Table 5. 2003 Greenhouse gas emissions

Activity	GHG emissions (Mt CO _{2e})	Contribution to overall emissions (%)	
	Ukraine	Ukraine	EU-15
Fuel extraction, processing, distribution and transport	168.6	32.0	5.4
Iron and steel production	96.3	18.3	0.4
Power and heat production	89.2	16.9	25.6
Industrial energy use	48	9.0	23
Residential fuel consumption	44.2	8.4	10.8
Agriculture	32.1	6.1	9.8
Waste management	15.3	3.0	2.0
Transport	10.0	1.9	21.6
Total	503.7	95.6	98.6
Emissions and/or sinks	2004	1990	
Land use, land use change and forestry	-32,137	-33,886	

⁴² GHG emission inventory 2003, 2005.

⁴³ Ukraine Data Profile, World Bank, August 2005.

151. Sectors with the largest GHG emissions may not represent all opportunities for GHG reduction activities. Some sectors, such as residential heating, can contribute significantly to emission reductions in the power and heat production sector with appropriate targeting of demand side management measures. Increasing forest cover can have an additional impact on GHG emissions by creating a net sink for carbon dioxide.

152. Since greening is voluntary and not defined under the Kyoto Protocol, Ukraine may decide to link the GIS to other priority projects and programs, subject to agreement with buyers. For example cross cutting concerns such as energy security and efficiency or adaptation programs. Ukraine could alternately decide to sell some assigned amount units without greening or hold them beyond 2008-12.

153. A sound pipeline of projects for GIS that can be implemented relatively quickly is important. When Ukraine decides to establish a GIS a more detailed sector assessment should be performed to identify high priority and quick to implement projects to include in the GIS pipeline. The Bank would be ready to assist Ukraine in this regard.

GREENING AND GREENING CRITERIA

154. Ukraine should set transparent criteria for project selection (e.g. status of preparedness and readiness for implementation) to develop a project pipeline under GIS. Since greening will be negotiated between Ukraine and potential buyers, it may be helpful to consider general principles to guide greening policy before setting criteria for project selection.

155. *Scope of greening.* Ukraine could focus greening on reducing greenhouse gas emissions or it could include investments to reduce non-greenhouse gases, to support other environmental projects or programs. Some buyers may want a 1:1 relationship between the number of assigned amount units sold and the number of tons of emission reductions achieved by applying AAU proceeds, but this is a matter for negotiation, in part because certain projects may yield fewer GHG emission reductions but could generate other environmental benefits. Potential buyers will accept a broader scope of greening if it is the seller's priority—water treatment, waste management, sustainable agriculture, or sustainable transport.

156. *Economic intervention.* Political principles, pragmatism, and other considerations may influence Ukraine's decisions on greening criteria and how to put money into the economy. It may want to avoid subsidies or provide incentives for behavioral change by regulating or creating market mechanisms.

157. *Public sector—private sector.* Ukraine will have to decide whether to support public or private sector entities or both—should AAU proceeds provide soft financing to project owners? Should Ukraine support project owners or activities that have no access to capital? (e.g., dilapidated district heating plants).

158. *Profit—non-profit.* Profit-making entities can obtain funding, including for certain carbon finance projects, through Joint Implementation. Non-profit entities may find it much harder to raise funding. Supporting non-profit projects (e.g., energy efficiency in hospitals) or education and public awareness (e.g., energy efficiency campaigns) could balance measures across the community and economy.

159. *Criteria for prioritizing.* Many sectors and activities could benefit from the AAU transaction proceeds so after Ukraine establishes greening strategy principles it must specify criteria to prioritize projects and investments.⁴⁴ Then Ukraine could offer projects by auction or could rely upon GIS management to develop a project pipeline based on these criteria.⁴⁵

160. Proposed greening criteria are summarized below, drawn from greening proposals and discussions with Ukraine government representatives and sector experts.

- *Viability.* If projects are demonstrably viable in their own right, GIS funding would simply provide windfall gains, but some viable projects may need GIS funds to overcome initial barriers. For example, projects could lack of viability due to inadequate initial financing, inherently low returns, long payback, small project size, or risks that the private sector cannot tolerate. Some projects may qualify for joint implementation but face some of the above hurdles, and it may be possible to enhance their viability with early or late crediting through a Green Investment Scheme.
- *Abatement cost.* Ukraine could set a maximum abatement cost per ton of CO₂ reduced. Calculation of abatement costs may not be easy and could be prone to manipulation.
- *Project quality and commitment.* To minimize its greening delivery risks Ukraine could select well-prepared projects or programs for greening; projects that have an experienced and committed sponsor and management, are supported by thorough planning, risk assessment, and a detailed financial plan. Projects should be accompanied by a viable method of monitoring and reporting emissions reductions or other environmental benefits.
- *Urgency.* Ukraine could prioritize projects that have critical time-lines and would yield significant benefits from quick response. For example, a derelict district heating plant in need of refurbishment for the next heating season is urgent and would quickly impact emissions.
- *Leverage and replicability.* Projects that have benefits beyond their own reduction in emissions provide additional value because they stimulate further systemic reductions.

⁴⁴ The establishment of a set of criteria assumes a systematic approach to greening, possibly via the establishment of a broad scheme. This could be necessary if a large amount of funding is raised through many AAU sales before concrete targets for spending are agreed on. If sales of AAUs are piecemeal and greening targets agreed on an ad hoc basis with the buyer, then a systematic set of criteria may be less important.

⁴⁵ New Zealand's Projects to Reduce Emissions provides an example of how an incentive structure and tendering process can be used to engage the private sector in greening. Useful lessons are also derived on the importance of designing criteria for project selection. See Annex E.

- *Prevention versus cure.* Projects that prevent future problems could be a priority. For example, transport emissions are the highest growing category of emissions in Western Europe.⁴⁶ Planning and support of sustainable transport initiatives could prevent transport emissions from becoming the most threatening category of emissions in Ukraine. Similarly, education may curb emissions growth in the long-term.
- *Broader benefit to the community.* Measures that generate broader benefits to the community such as energy efficiency measures in (public) buildings, awareness and educational programs. However, potential buyers may not like these long-term and hard-to-quantify measures; they may also need educating.
- *Limited alternatives.* Sectors such as state forestry have limited access to capital and there may be important social reasons for not privatizing forests. In contrast, industrial companies have broader access to funding sources.

PROJECTS AND PROGRAMS FOR GREENING

161. After Ukraine establishes greening criteria, it could spend AAU proceeds on a wide range of innovative greening measures. A range of options is provided below (this is not an exhaustive list).

162. *Education.* Proceeds could support long-term efforts in education, raising awareness, and encouraging public participation in combating climate change.

163. *Financial schemes.* Proceeds could support financial schemes that encourage investment in emission-reducing activities, such as clean energy venture capital funds or sustainable banking products.

164. *Policies and removing barriers.* Proceeds could be used to develop and implement policies or regulations that aim to reduce GHG emissions, including power sector deregulation, or mandatory energy efficiency standards for buildings.

165. Policies can remove barriers that prevent enterprises from reducing emissions; for example, raising energy prices to market levels would create incentives for efficient energy consumption. Although price increases could also trigger political resistance, GIS funds could be used to assist poor households to adapt, or to raise public awareness and build political consensus for efficient energy consumption.

166. However, in designing such interventions it is important to strike a balance between supply and demand measures, as demonstrated by international energy and environmental policy experience. For example, a GIS-subsidized renewable energy project will fail unless there are countermeasures to create sustainable demand for

⁴⁶ Transport emissions in the EU-15 grew 26 percent between 1990 and 2004. European Environment Agency, Annual European Community greenhouse gas inventory 1990-2004 and inventory report 2006 –submissions to the UNFCCC secretariat-, Brussels (2006) 154.

renewable energy. Subsidized energy efficiency projects will flounder unless there are countermeasures to correct shortages of energy efficiency experts and engineers.

167. **Projects.** Proceeds could support public and private sector projects that reduce greenhouse gas emissions, including projects across a broad range of sectors—energy, housing, transport, agriculture, mining, heavy industry, and so forth. However, one of the pitfalls of choice is getting bogged down in unsuccessful projects, wasting resources and time. Strict application of project selection criteria can mitigate this risk. Projects could also be supported that have other environmental benefits, such as reductions in other pollutants, or improvements in environmental monitoring.⁴⁷

168. A structure already exists for funding projects that result in a reduction of emissions, namely joint implementation. A GIS could complement JI and enhance benefits because GIS has the flexibility to support projects that face barriers under JI, where emission reductions are hard to verify, where the timing extends beyond 2012 or to provide delivery guarantees for JI projects. A Green Investment Scheme could for example establish a revolving fund that pre-finances JI project development, defining project design and producing Project Design Documents. While the trading of AAUs is confined to 2008–12, GIS can be used to capture emission reductions and other benefits from projects in the pre-2008 and post-2012 period allowing longer lead times for projects and their implementation.

169. Ukraine should be careful not to over-design a Green Investment Scheme thereby creating a quasi-JI structure. Simplicity will likely be the key to success for Green Investment Scheme, and the JI mechanism is complex.

170. **Programs.** Funding could establish programs or initiatives that can be replicated across the country, for example, a scheme to improve energy efficiency in public buildings.

HOW TO DISBURSE FUNDS TO PROJECTS AND PROGRAMS

171. Disbursement mechanisms distribute funding to greening projects and programs. Since disbursement terms influence recipients' behavior and projects and program outcomes, it is essential to design a match between desired behavior and outcomes. Disbursement terms require Ukraine to decide whether a project owner should repay GIS funds; whether the funds would bear interest; whether the Green Investment Scheme should expect returns commensurate with its risk; and what impact terms and conditions have on the "market" the Green Investment Scheme aims to serve. The following paragraphs describe some disbursement mechanisms that Ukraine may consider:

⁴⁷ The Ministry for Emergency Situations is responsible for a country wide system of environmental monitoring including hydro meteorological services. Hydro meteorological observations allow Ukraine to evaluate and register changes to Ukraine's climate resulting from economic activities, thus forming a basis for evaluating the effectiveness of emission reduction activities on the global climate.

172. *Equity*. Equity means the fund provider wants to share investment proceeds, but also risks losing the money in the event of failure. Equity encourages business building if private capital is not flowing towards businesses in sectors relevant to emissions management. Equity funding has been effectively used by multilateral institutions in Hungary in the 1990s, for example, for setting up energy service companies, similar to Ukresco.

173. *Debt and guarantees*. Debt or guarantees (which are economically similar) imply that the funding provider is taking less risk on an investment than the provider of equity funding and is therefore expecting a lower return. The intention is that the debt will be repaid over an agreed term. This might be a suitable approach if Ukraine wishes to recycle AAU proceeds over several years into new projects.

174. Loan guarantee schemes have been successfully applied by the IFC in Central and Eastern Europe to support energy efficiency projects. Rather than crowding out private sector banks, loan guarantees can help banks take risks and gain exposure and experience. An interest support scheme is similar in that it compensates banks for lending to higher-than-normal risk emission-reduction projects.⁴⁸

175. *Grants and soft financing*. The recipient is generally not required to return funds to the provider or to make an economic return. These “free” funds may be necessary to support non-profit causes, or to “top up” entities’ investments so they can achieve an economic return—to encourage entry-level participation in a sector or activity for example.

176. Grants and soft financing can leverage the value of other funding by helping entrepreneurs present their proposals to financiers, an approach successfully used for supporting small businesses in the United Kingdom. Grants could be performance based and designed to disburse funds on delivery of agreed results. The NGO roundtable proposed using grant money to finance business plan preparation and feasibility studies.⁴⁹ Most education and training programs would likely be grant-based.

177. If Ukraine is considering different forms of disbursement mechanisms for greening projects and programs it might also consider which institutions would best be suited to handle them. Typically *equity* is best handled by private equity funds, which have management experienced in valuation of companies, analysis of risks, and negotiation of investment transactions. In contrast *Loans and guarantees* are best handled by private banks or public agencies because they have standard processes for risk evaluation and credit appraisal, and often a country-wide network to facilitate recipient access. Table 6 shows disbursement mechanisms and institutions.

⁴⁸ Also suggested by the roundtable held with energy sector experts in Kiev (see Annex I).

⁴⁹ Summary of the NGO roundtable in Annex I.

Table 6. Financial disbursement mechanisms and institutions

Mechanism	Institution	Rationale
Equity investment	Private equity fund	Private equity funds specialize in equity investments. They are most successful at risk evaluation, negotiating terms, and driving the investor once the investment has been made
Loan, guarantee	Commercial and state-owned banks	Commercial banks specialize in credit assessment, efficient distribution of loans, and monitoring ongoing creditor performance. Nationwide networks enhance distribution of loans or guarantees. Public institutions and government owned banks may be more suitable for issuing guarantees.
Grant	Government agency, NGO, charitable institution	Traditionally government institutions distribute grants. Distribution of grants should also be financially rigorous.

SUMMARY

178. GIS proceeds can support investments in projects or programs that reduce GHGs or provide other environmental benefits including broader initiatives such as capacity building, policy change, or the administrative costs of the GIS itself. Ukraine should consider establishing transparent criteria for project selection (e.g. status of preparedness and readiness for implementation) to develop a project pipeline.

179. A sound pipeline of projects for GIS that can be implemented relatively quickly is important. There is significant greening potential particularly in the fuel and energy, heat and power generation, iron and steel, industrial energy use, the residential sector, agriculture, waste management, transport and forestry sectors.

180. A GIS could complement JI and enhance benefits because GIS has the flexibility to support projects that face barriers under JI, where emission reductions are hard to verify, where the timing extends beyond 2012 or to provide delivery guarantees for JI projects.

181. The funding mechanisms that Ukraine uses to disburse funds – e.g. investing in equity, provision of debt, issuance of guarantees or provision of grants – should be carefully considered since this will influence the behavior of recipients and the outcome of their projects and programs.

Section 7. The Case for a Pilot Transaction

182. The market for AAU trading is undeveloped. Ukraine should begin to position itself now to compete successfully by 2008 with other sellers. Ukraine can establish a reputation as a reliable partner by achieving and maintaining compliance with the international requirements for AAU trades.

183. Ukraine should consider entering the AAU market with a simple pilot transaction (in the range 10 – 20 million AAUs) to test buyers' readiness to act, and for Ukraine to gain low-risk experience at AAU trading.

184. Buyers have expressed more concern over the good governance of GIS revenues than over the way GIS revenues are greened. Completing several early pilot transactions will provide explicit confirmation that the revenues from AAU transactions are properly managed and invested and give buyers confidence that Ukraine can help them meet their compliance targets. Purchasing assigned amount units from Ukraine would become a politically viable method for Annex-1 countries to fulfill their commitments under the Kyoto Protocol. This will increase the value of the Ukrainian AAU asset.

185. A successful operation of GIS in Ukraine will not only enhance confidence from the buyer's side but also stimulate private sector participation in GIS. Generally the political turmoil and specifically the slow pace of implementation of the JI approval procedure has damaged the confidence of the private sector in Ukraine and made them reluctant to invest in new projects.

186. A pilot transaction could raise funds to support greening projects and administration of AAU trading and Green Investment Schemes, and to test the legal framework and potential GIS structures, such as project selection and appraisal, financial management, monitoring and verification of greening. Examples of successful transactions will make both GIS and JI more attractive, and should make it easier to attract funding for subsequent projects.

187. A pilot transaction also plays an important role in setting ongoing price expectations. It is vital that Ukraine applies a transparent price setting mechanism. Accepting a too low price will not benefit Ukraine.

188. Ukraine should consider the following steps to execute a successful pilot transaction—these could be completed in a few months. The pilot sale would test the institutional framework, state investments rules, and provide lessons that could be applied to a more comprehensive institutional model and regulatory framework. The pilot could lead to a Government decision to establish a programmatic Green Investment Scheme, following these recommended procedures:

- Ministry of Environmental Protection prepares a draft resolution (for the Cabinet of Ministers) for managing national AAU assets and participation

in International Emission Trading; the resolution should define greening criteria, responsibilities, and principles of negotiating and concluding pilot sales of up to an established amount of assigned amount units.

- Adopt Cabinet of Ministers resolution clear the path for the implementation of one or several pilot transactions.
- Allocate responsibilities.
- Design a pilot sale and prepare a term sheet setting out the target terms and conditions.
- Select a low-risk and quick-to-implement greening project or projects, and attach a concise and persuasive project description to the term sheet.
- Approach three or four motivated AAU buyers—e.g. Italy, Japan, Spain - and establish a clear time-frame and process for closing the transaction.
- Select the best buyer terms and complete the transaction by agreed deadline.

189. Costs for a pilot transaction, as outlined above, are estimated below in Table 7. These costs represent costs external to the Government only. They do not cover the cost of establishing a full programmatic GIS.

Table 7. External costs for pilot transaction

<i>Task</i>	<i>Outputs</i>	<i>Responsibility</i>	<i>Estimates Cost (external)</i>
Legal and regulatory framework development	Drafting and adoption of Cabinet of Minister decree	Government with external support	US\$40 - 60K
Structuring a transaction	Identification of pilot project	Government with external support for appraisal	US\$ 60 – 120K
	GIS consultations with potential purchasers	Government with external support	US\$60 - 120K
	Development and negotiation on terms sheet	Government with external support	US\$60 - 120K
Logistical support	Including translation, editing, and printing of materials; dissemination	Government	US\$20 - 30K
Implementation of pilot transaction	Verification of milestones and results	External consultants	US\$60 - 150K
	Supervision, fiscal and contract management	Government	US\$ 50 – 100K

190. If further demand for Ukrainian assigned amount units is obvious, subsequent sales transactions could be more complex (potentially higher returns to the Government). A programmatic Green Investment Scheme could be established, requiring a formal law, but institutions should be built in response to increasing demand, not before.

191. A lack of motivated buyers ready to execute a pilot transaction may indicate insufficient demand; Ukraine may wish to delay sales until demand strengthens because entering the market too early will weaken their position.

Section 8. Summary of Key Decisions

Table 8. Key decision summary

<i>Area</i>	<i>Key decisions</i>
Position in the market	
Leadership	Whether Ukraine prefers to lead or follow will determine the urgency and priority needed in establishing the framework to conduct an AAU transaction. Reputation and economic implications are at stake.
Cooperation	Will Ukraine cooperate with other seller countries to manage supply and delivery risks including potential problems of oversupply in the AAU market?
Kyoto position	Does Ukraine want to promote a post-2012 regime? This could affect the value of 2008-2012 AAUs.
Regulations	
Regulatory background	Ukrainian Government must decide whether to offer AAUs under a GIS, how many AAUs, and whether to undertake a pilot transaction, which will require a cabinet of ministers' decision to authorize and a ministry to implement and negotiate. Implementing a more sophisticated GIS, involving private entities, will likely require a formal law establishing GIS.
Kyoto eligibility criteria	Ongoing AAU trading requires Ukraine to achieve and maintain eligibility. Sufficient resources and political attention must be devoted to this.
Disbursement of AAU sales proceeds	Responsible ministries should agree on how to create accord between management of GIS funds and existing laws on budget, state aid, and competition.
Sales contract	Will Ukraine enter into a treaty; enter into a sale under private international law or assigned AAUs to the private sector?
Transactions and risk	
Counterparts	Individual or multilateral contracts with counterparts?
Structure	Forward or spot sales? How to fund greening? How to link transactions to greening?
Forms of sale	Negotiated sale? Tender? Auction? Listing?
Risk	What level of transaction risk is acceptable? How to manage and monitor transactional risks?
Organization	
High-level responsibility	Who will develop policies? Who will approve policies and strategy on AAU trading and Green Investment Schemes? How? Who will supervise?
Structure	Start with informal <i>ad hoc</i> organization? Start with structured organizational design?
Operative responsibilities	How will responsibilities be allocated across ministries and institutions?
Private sector involvement	To what extent will the private sector be engaged in the management or operation of a GIS, and on what basis? How will private sector entities be approved, hired, and dismissed?
Use of proceeds	
Areas of spending	Criteria for selecting areas to spend on?
Project selection	Criteria for selecting individual measures?
Monitoring	Emission reductions monitored and reported? How?
Pilot transaction	
Pilot transactions	Will there be a pilot transaction? When? How much?

Annex A. Legal Framework for Emissions Trading and Ukraine's Eligibility

This Annex reviews the language of the Kyoto Protocol, the international legal framework for emissions trading, and the implications for buyers and sellers. It examines Ukraine's eligibility for international emission trading.

INTERNATIONAL LEGAL FRAMEWORK FOR TRADING EMISSIONS

The base unit of the Kyoto Protocol is the AAU, each unit effectively represents the right of an industrialized country (Annex-1 of the UNFCCC, or Annex B of the Kyoto Protocol) under Article 3 the Kyoto Protocol)¹ to emit one metric tonne of carbon dioxide equivalent of a greenhouse gas during a commitment period (2008-12). Countries can acquire and transfer AAUs in accordance with Article 17 of the Kyoto Protocol.

Tradable units under the Kyoto Protocol are defined as a unit of "one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5".² Units will each have a unique serial number by which they can be tracked and recorded through national registries established and maintained by countries. These numbered "accounting" units, were created by an act of international law, the Kyoto Protocol, which does not obligate any private or public entity other than the signing and ratifying State, meaning that governments create, own, and hold all emission rights. Therefore AAUs issued by Ukraine are owned by Ukraine.

These rights need to be reconciled with the Marrakesh Accords, which "the Kyoto Protocol has not created or bestowed any right, title or entitlement to emissions of any kind on Parties included in Annex-1".³ In the political context of the Kyoto Protocol this means...

- The Kyoto Protocol does not create emissions rights or atmosphere rights; it creates only the right to a defined pollution amount in a defined timeframe. AAU allocation does not grandfather future authorizations for pollutants, or bestow Annex-1 countries' entitlements beyond the first commitment period (2008-12).

Since an AAU does not represent a property right in the atmosphere itself, recognizing AAU rights as a type of property under national law is consistent with the preamble to the Marrakesh Accords, a possibility considered by the Kyoto Protocol's mechanisms, which clearly permit private entities to hold and transfer AAUs. Parties to Kyoto may authorize and accept responsibility for private-entity participation, which can be done only by operating under national laws.

¹ In the following we will refer to "Annex I countries" or "industrialized Parties" it being understood that this reference implies an allocation of AAUs under Annex B of the Kyoto Protocol.

² Decisions 16/CP.7, 17/CP.7 and 18/CP.7 of the Marrakesh Accords.

³ FCCC/CP/2001/13/Add.2 Decision 15/CP.7 Principles, nature and scope of the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, preamble; Draft Decision -/CMP.1 (Mechanisms), preamble.

Under public international law AAUs can be considered a right based on a treaty; AAU legal status under domestic law will depend on jurisdiction; AAU classification will have implications for their treatment under tax and insolvency law; whether they are indefeasible when held by private entities (i.e., whether Ukraine can take them back with/without compensation to the holder); what rules or regulations (if any) apply to enable transfer (e.g., are sales contracts regulated as financial instrument?); whether they can be used as security and be subject, for example, to a charge or a mortgage. Since the EU Emission Trading Scheme was implemented, EU member states now have the most sophisticated legislation on emission rights; in most countries the legal parameters of such rights depends on the context—emission rights can be considered services, goods, grants, or permits depending of the area of law.

EMISSION TRADING AND THE FLEXIBLE MECHANISMS

The Kyoto Protocol defines industrialized countries' caps on GHG emissions; countries may achieve these targets domestically or through the following international market-based mechanisms:

- *Joint implementation.* Purchasing emission reduction units from projects in Annex-1⁴ (“industrialized”) countries (about 95 percent of projects are in economies in transition)⁵ under Article 6 of the Kyoto Protocol. Joint implementation allows private and public entities from one industrialized country to invest in emission reduction projects in another industrialized country. In return for their investment, or their promise to pay on delivery, private and public entities receive emission reduction units from the project, which mitigates emissions against an established baseline;
- *Clean Development Mechanism.* Purchasing Certified Emission Reductions from developing country projects under Article 12 of the Kyoto Protocol
- *International Emission Trading* (of AAUs). Among Annex-1 countries under Article 17 of the Kyoto Protocol, international emission trading allows industrialized countries to transfer and acquire assigned amount units. Governments can authorize companies to trade assigned amount units.⁶ International emission trading is the only flexible mechanism without a formal requirement for emissions reduction to justify a transaction, which means that countries can allocate IET transaction proceeds without restrictions.

Economies in transition can create an inflow of investment capital by using the joint implementation and IET flexible mechanisms. The JI mechanism enhances private sector projects, increasing the return on investments that reduce GHG emissions. Significant private sector interest exists in JI projects since emission reduction units,

⁴ Annex-1 countries refer to those countries that have assumed emission limitation targets under the Kyoto Protocol and are listed in Annex 1 to the UNFCCC and the Kyoto Protocol.

⁵ Clean development mechanism/joint implementation pipeline, Danish Risø Center (20 June 2006).

⁶ FCCC/CP/2001/13/Add.2, *Modalities, rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol*, p53.

unlike assigned amount units, can be used by private sector entities to meet their compliance targets under the EU Emission Trading Scheme. Higher demand for emission reduction units will influence the price for the different credits and ERU prices are expected to lie above the price for assigned amount units. Therefore a Green Investment Scheme should not undermine the demand for joint implementation but should be designed to complement and support JI opportunities.

Compared with JI, AAU transfers have the advantage that they can be realized quickly and possible greening activities can be implemented in anticipation of future funding. They are also less sensitive to the success of individual projects in generating emission reductions. AAU trading may therefore present an effective tool for industrialized countries to mitigate their risk of non compliance while reducing the demand on institutions to evaluate and monitor individual projects in other countries.

COMPLIANCE WITH THE KYOTO PROTOCOL – ELIGIBILITY CRITERIA

To participate in AAU transactions and therefore in a Green Investment Scheme, countries have to meet the eligibility requirements defined in the decisions taken under the Kyoto Protocol.

Annex-1 Parties including Ukraine must comply with these requirements to be able to transfer assigned amount units to another Annex-1 Party to meet its contractual obligations under an AAU transaction. The eligibility requirements are the following.

- Party to the Kyoto Protocol;
- Assigned Amount calculated and recorded according to guidelines and decisions;
- Established national system for estimating all GHG emissions by sources and removals by sinks;
- Established national registry;
- Annual submission of the most recent required GHG inventory;
- Submitted supplementary information (e.g., on sinks) on Assigned Amount and completed required adjustments and recalculations.⁷

STATUS OF UKRAINE'S ELIGIBILITY FOR INTERNATIONAL EMISSION TRADING

By December 31, 2006, each Annex-1 Party to the Kyoto Protocol has to submit its Initial Report to the UNFCCC Secretariat⁸ demonstrating that all institutions and systems are in place to account for GHG emissions, to estimate the Assigned Amount

⁷ Decision 18/CP.7 of the Marrakesh Accords, *Modalities, rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol*. The UNFCCC dedicated a special web page to the preparation of the fourth national communication by Annex-1 Parties:
http://unfccc.int/national_reports/annex_i_national_communications/items/3360.php

⁸ Streamlining review processes under the Convention and the Kyoto Protocol, Subsidiary Body for Implementation, 4 October 2005 (FCCC/SBI/2005/16).
<http://unfccc.int/resource/docs/2005/sbi/eng/16.pdf>

and commitment period reserve, and to report on the status of compliance with the emission reduction obligations described in the Kyoto Protocol.

Ukraine's compliance with eligibility criteria is shown in Table A1. Consultants funded through a European Union Technical Aid to the Commonwealth of Independent States (EU TACIS) grant program are assisting Ukraine in providing information on the Assigned Amount and GHG inventories. The Japanese Government has authorized a grant from the Policy and Human Resources Development Fund (PHRD) through the World Bank to help Ukraine meet IET eligibility criteria and to prepare a pilot greening program in the industrial sector.⁹ However, Ukraine has yet to establish basic requirements to receive the grant and to procure the necessary expertise.

Ukrainian officials have advised that implementation of the trading infrastructure is well advanced and that Ukraine will meet all criteria to participate in International Emission Trading by the end of 2006 provided that current programs meet their objectives and are implemented as planned. However, relying on nationally developed software rather than procuring one of the standardized and tested registry systems constitutes a risk for Ukraine and counterparties that rely on the functioning of the Ukrainian registry.

Specifically Ukraine has indicated its intention to submit an Initial Report by the end of 2006. Once submitted the UNFCCC secretariat will have to review the initial report from Ukraine as well as from all other Annex-1 countries. To prevent Ukraine being disadvantaged by the capacity of the UNFCCC to review these reports in a timely manner it is advisable that Ukraine submit its initial report as soon as possible. Initial reports have already been submitted to the UNFCCC for review by Hungary, Japan, New Zealand, and Slovakia (October 17, 2006).

⁹ The World Bank's Greening Industrial Modernization (GIM) project is being designed to provide incentives for industry to make environmentally friendly investments in its modernization, thus contributing to mitigation of global climate change. GIM could serve as a mechanism to show how the proceeds from the forward sale of AAUs can be used to achieve additional greenhouse gas and other industrial emission reductions.

Table A1. Status of Compliance with Eligibility Criteria

<i>Area</i>	<i>Status</i>	<i>Risk areas</i>
Inventories	Up to date in inventory submissions. Ukraine has submitted to the UNFCCC Secretariat five inventory reports (1990 to 2004).	UNFCCC experts stress clear institutional arrangements are needed for inventory preparation.
National System	Not yet implemented in practice. Decree of the Cabinet of Ministers (№554 from April 21, 2006) established the legal base for the national system. The Ministry of Environmental Protection is responsible for operation the national system. ^a	.
Registry	Under development by Ukrainian experts. Software has been submitted for certification to the National Security Service. Climate Change Centre of the Ministry of Environmental Protection will manage registry. ^b PHRD grant will help set up registry administrator's office and train staff.	Ukraine is developing registry software creating a technical risk of delays and non-performance. Registry testing can be completed only when UNFCCC has issued AAUs and the Independent Transaction Log, with which it should communicate, is installed. UNFCCC advised its plans to enable national registries to connect to the Log in April 2007.
Calculation of Assigned Amount	Technical issues outstanding - calculation of assigned amount to be in Initial Report. Technical decisions concerning accounting of emissions of particular sectors still to be made. TACIS supports assigned amount calculation; additional support can be provided through PHRD grant.	
Supplementary information on assigned amount	Completed - National communications contain supplementary information on Assigned Amount.	

^a Article 6 of the Decree №554 of April 21, 2006. The Ministry of Environmental Protection is responsible for the collection of GHG emission data from local executive authorities, elaboration of a plan for inventory preparation, updating information on coefficients of emission and sinks, making inventory results available to the public, sending inventory reports to the UNFCCC Secretariat and archiving inventory data.

^b Second National Communication of Ukraine on Climate Change Issues (Kiev, 2006).

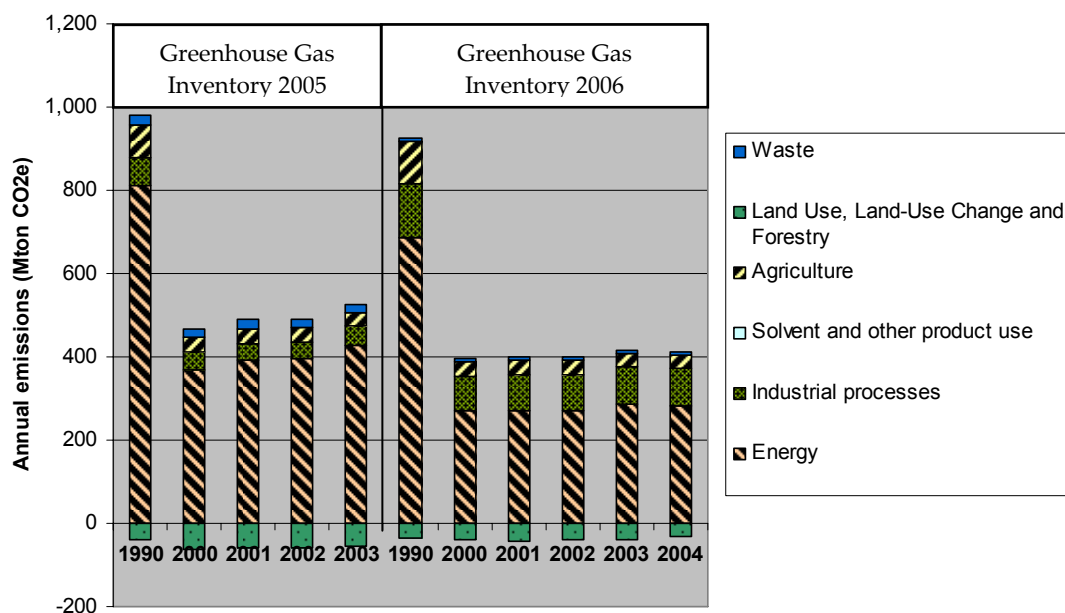
Annex B. Ukraine's Greenhouse Gas Inventory

This Annex reviews Ukraine's Greenhouse Gas inventory changes over time.

GREENHOUSE GAS INVENTORY

Ukraine published its latest greenhouse gas inventory in May 2006, covering emissions from 1990-2004.¹ This most recent inventory differs significantly from that of the previous year, which covered 1990-2003, because emission estimates were corrected in the 2006 version for the waste, energy, and industrial sectors. In this latest version, 2003 emissions in the waste sector have been lowered by 61 percent and in the energy sector, 33 percent, but emissions from industrial processes nearly doubled. Overall emission levels for 2003 were lowered by around 20 percent in the 2006 version.

Figure B1. Ukraine's Greenhouse Gas Inventory—Annual Emission Projections



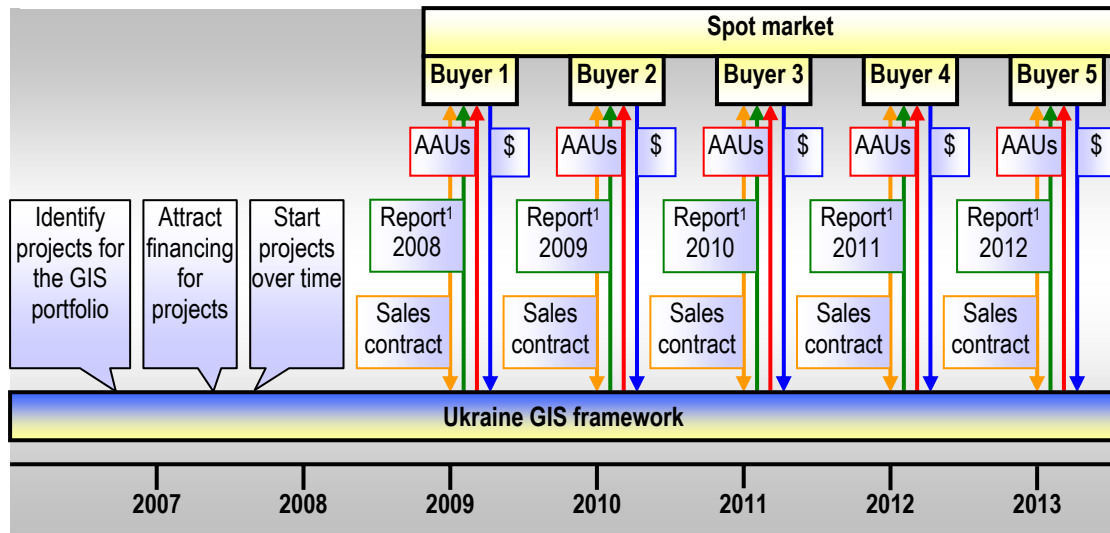
Differences in estimates of historical emission levels affect current emission projections, base-year emissions, and subsequent headroom estimates. Taking adjusted 2003 emissions as the reference year, the 2006 inventory version forecasts headroom around 9.0 percent higher than that in the 2005 inventory version.

¹ Ministry of Environmental Protection of Ukraine (2005), National Report on Greenhouse Gas Inventory of Ukraine, 2003 –Volume 1-, Kiev. Ministry of Environmental Protection of Ukraine (2006), Национальный отчет о кадастре выбросов парниковых газов и их поглощения в украине за 1990-2004 гг, Kiev.

Annex C. Forward and Spot Transactions

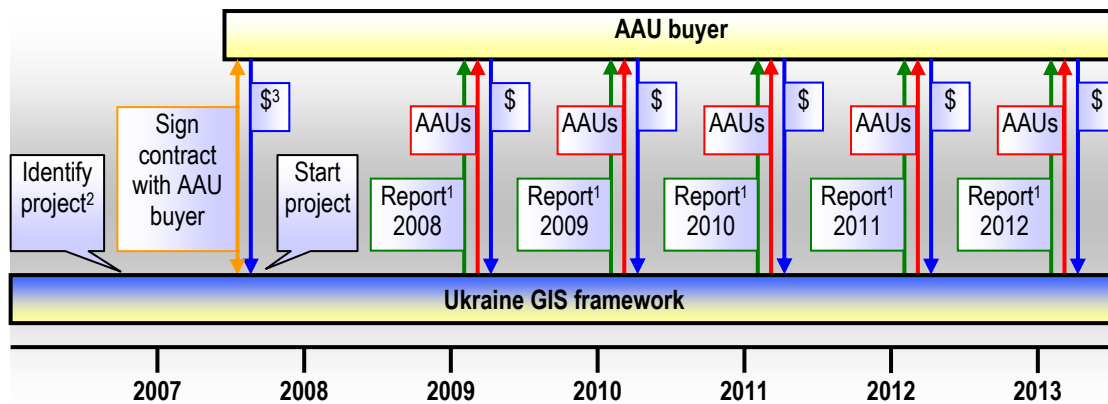
A) Spot market sale

The option is based on selling AAUs on the spot market. The sale of AAU is accompanied by annual reporting on project performance on greening. Ukraine can choose to develop new projects and abandon existing projects during the operation of the GIS.



B) Forward sale

The option is based on selling AAUs under forward contracts. The model assumes forward payments to support greening activities. Annual delivery of AAUs and payment from the AAU buyer.



¹ Report on the performance of the greening activities and financial flows in the indicated year.

² Ukraine and the buyer can agree to finance programs instead of particular projects.

³ Upfront payment of part of the contract value for the delivery of AAUs. The rest of the total contract value will be paid upon delivery of annual reports on the performance of the project or the achievement of milestones.

Figure C1. Possible timelines for forward and spot sales of AAUs

A forward sale involves trading assigned amount units with a future delivery date; a spot trade involves immediate payment and delivery of assigned amount units. Because a forward sale has higher risk the unit price is typically discounted compared to spot trade price.

Ukraine could transact forward sales for future delivery of assigned amount units and/or greening activities. The actual transfer of assigned amount units would be

possible only after countries fulfill the International Emission Trading eligibility requirements—expected at the earliest in 2008. Payment could be linked to delivery of assigned amount units, to greening activity completion, or for a lower price, to future greening.

Ukraine could transact a forward sale of assigned amount units now to establish a position in the AAU market, generate further emission reductions, and share or reduce transaction risks. Early sales by Ukraine could later be rolled into a broader Green Investment Scheme covering various sectors.

For spot transactions, Ukraine would have to sell assigned amount units and deliver greening at the same time. This means that Ukraine would have to implement the greening activity before receiving AAU sale proceeds, thereby running the risk that greening costs may exceed proceeds. To sell assigned amount units, Ukraine must meet IET eligibility criteria; AAU price will depend on demand at the time of sale. Table C1 shows a comparison of forward sale and spot trade.

Table C1. Comparison of forward sale and spot trade

	<i>Forward sale</i>	<i>Spot trade</i>
Financing	Forward sale can include advance payments or serve as collateral for negotiating bridge financing.	Financing institutions are less likely to take future AAU revenues into account.
Buyer and seller risk	Buyers risk by providing pre-payment, but benefit from discounted AAU price.	Ukraine or the project developer risks by financing greening projects upfront, but benefits from premium AAU price.
Project types	Upfront payments allow implementing projects with financing gaps.	Without secure carbon financing, projects must be feasible and profitable. Government could bridge financing gaps.
Delivery risk management	<i>Greening.</i> Greening activities are selected during negotiations between Ukraine and buyer. In principle parties share risks of greening. <i>Transfer of AAUs.</i> Buyer and Ukraine share interest in Ukraine's eligibility for AAU trading. With advance payments or bridge financing, Ukraine could be liable for defaults under AAU delivery obligations.	<i>Greening.</i> Ukraine can develop a project portfolio fully according to its own priorities. Government assumes risk that buyers will accept greening. <i>Transfer of AAUs.</i> Ukraine solely responsible for creating the AAU asset by achieving eligibility for AAU trading.
Contract with buyer	Individually negotiated long term off-take and financing agreements.	Highly standardized spot market contracts.
Pricing	Negotiated forward price reflects parties' shared risks and expectations at time of contract signing.	Spot price depends on perceived value of AAUs at the time trade takes place.

Annex D. Funding GIS—Securitization Proposal

This Annex reviews the securitization proposal for funding a GIS prepared by the Climate Change Center of the Ministry of Environmental Protection.

RAISING FUNDS FOR GIS

When establishing a GIS, Ukraine will need resources to:

- Identify a project pipeline, and provide initial financing of project documents;
- Provide upfront financing for many of the projects;
- Source bridge financing if Ukraine decides to establish the GIS before it is eligible to transfer AAUs—before the beginning of 2008 at the earliest.

The Ukrainian Climate Change Centre has developed a model to generate upfront revenue for greening activities (see Figure D1). The model is based on the “securitization” of AAUs embedded in the Ukrainian voluntary emissions trading system, the main purpose of which is to raise funds for a GIS.

Under the proposed system, the Ministry of Environmental Protection transfers the right to manage a portion of Ukraine’s AAUs to a newly established government entity (the “Carbon Fund”)¹. The Carbon Fund would issue a security, a “Carbon Equivalent Emissions Certificate” (CC),² which could be traded on the Ukrainian stock exchange. Each CC would embody the right to request the Ukrainian National Registry Administrator, once the registry has been established, to transfer one AAU from the Ukrainian registry to another Annex-1 country registry. The initial price of the CC would be set at €8, but as the mechanism that develops the price would be determined at public auctions. The CCs would be placed and traded in accordance with Ukrainian securities legislation. The value of CCs would increase as underlying greening takes place through funded projects, thereby turning AAUs into higher-value greened AAUs.

¹ Referred to as “Carbon Fund” this entity is either formed by the Ministry of Environment and the Ministry of Finance or, by a pool of international and national investors such as the World Bank, European Bank for Reconstruction and Development, and Ukrainian investors. In the latter case the Fund may borrow AAUs from Ministry of Environment.

² Depending on the translation the certificate is also referred to as “investment certificates”.

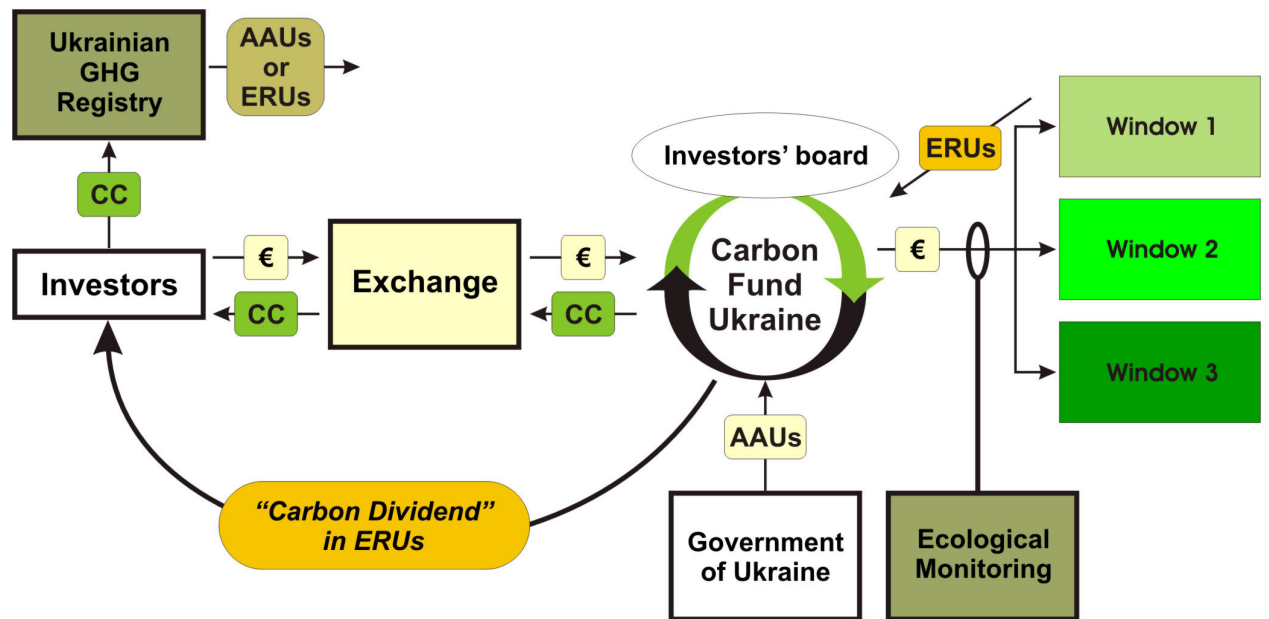


Figure D1. Overview of Securitization Proposal

The securitization proposal can be seen as the front-end to a greening system because it determines how funds are raised. But securitization alone does not determine how funds are disbursed; disbursement would be administered through a separate, independent GIS structure.

Advantages. Securitization allows Ukraine to raise funding by issuing a separate financial instrument rather than the underlying AAU. Since regulations already exist to issue securities to financial institutions and the public, fundraising could take place within an existing transparent regulatory framework.

Issuing CCs with legally defined rights for the holders and transparent price determination could sidestep current uncertainty about how the private sector could participate in AAU trade. Furthermore securitization might attract a wider range of investors than AAUs on their own, which could increase demand and price. Finally, CCs may attract speculative and venture capital, thereby increasing prices and foreign investment flows.

Demand risks. Demand for certificates will be determined by price and quality (credit quality and liquidity) and in today's market, few investors are interested in such certificates. First, the largest domestic institutional investors such as pension funds have limited investment choices and would be unlikely to invest much in new high-risk instruments. Sovereign guarantees on the instruments may not attract institutional investors who may be already overexposed to sovereign risk through government bonds. Offering sovereign guarantees may make the scheme financially unsatisfactory for the government. Other institutional investors such as insurance companies and mutual/investment funds are much smaller and/or not high-risk takers in Ukraine and would be unlikely to invest heavily in CCs. Second, few international investors are ready to invest in new high-risk instruments. Sub-

sovereign international investors may not be willing to invest in CCs unless they were steeply discounted against the price of AAUs.

Supply Risk. It is unclear whether the Ukrainian Stock Exchange would support CC trading; any problems with an untried high-risk financial instrument would create reputational risks for the exchange. Also, the CC securities scheme would need a strong legal and contractual framework and existing laws would likely require amendments to support AAU securitization.

If buyers are asked to hold these certificates, the proposed scheme implies two additional risks—Ukraine's market risk and the risk associated with converting the security into an AAU. The CC value and the securitization system depend on eligibility; if Ukraine is not eligible to transfer AAUs it cannot fulfill the inherent promise of a CC. Ukraine will have to manage this default risk.

Price Risk. First, the difference in value is limited between issuing CCs and issuing AAUs directly because the value of CC liquidity still depends on the ultimate value of the AAU. Hence the CC investor is still depending on a few Annex-1 country buyers, but institutional and retail investor exuberance could render the CCs issue price higher than Annex-1 countries would be prepared to pay for AAUs. Second, the value of CCs will be curtailed by the fact that buyers need a return on their investment, therefore the price of the high-risk CCs' will likely be discounted, at least initially. Since Annex-1 government buyers are likely to have lower discount rates than private sector investors, the sale price of CCs might not be materially higher than the forward sale price of AAUs.

Conclusion. Ukrainian investor interest is unclear since CC value depends on a broad understanding and a long-term view of the Kyoto Protocol. International investors may be interested but willing to purchase the security only if steeply discounted against AAU prices. Demand can be assessed only when the certificates are presented to potential investors. The CC design could be based on a market study of potential investors, quantifying their interest and the conditions they would require to invest.

The system should devise a strategy on how to hedge the default risk if Ukraine is unable to transfer AAUs when investors call on the transfer. Ukraine may consider holding some of its AAUs in registries outside of Ukraine, or purchasing an option on AAUs from a third country. These activities mitigate the AAU delivery risk but they increase overall costs.

Ukraine should evaluate implementation of the Climate Change Center's proposal in cooperation with a strong existing stock exchange that has a sophisticated investor base and strong legal framework—New York or London.

Ukraine could also consider issuing a Promissory Note that commits to sell a predetermined amount of AAUs to buyers when specific conditions are met. The

Note could be linked to earmarking the same amount of AAUs in Ukraine's AAU Central Registry, or transfer of this amount of AAUs into escrow in another registry.

Similarly, Ukraine, or the GIS if established as a legal entity, could raise upfront capital by issuing secured bonds backed by AAUs. Possibly the bonds could be issued in London or New York. The AAUs would be escrowed in an independent registry account and sold on the market prior to or when the bond matures. The revenue would repay the bond principle; risk/profit sharing terms for bond repayment may attract investment.

The fundamental viability of the proposed scheme will hinge on the legal status and governance structure of the Carbon Fund. To make this scheme transparent, the Carbon Fund could be merely a conduit rather than a fund with its own management and discretionary authority. Alternatively, the Carbon Fund could act as a public auction house and pass the proceeds immediately onto a GIS. Or the Carbon Fund could be eliminated and CCs could be issued directly to eligible projects that decide how CCs will be used.

Annex E. Managing the Greening Process—New Zealand

This Annex reviews lessons learned from New Zealand's experience with managing the greening process, including an overview of projects, project risk assessments, experience from the first tender, independent review, and application for the Ukraine.

NEW ZEALAND'S PROJECTS TO REDUCE EMISSIONS PROGRAM

Raising funds is an essential part of any GIS structure but the quantity of money raised will also depend on the credibility, transparency, and efficiency of the greening process itself. The GIS will gain credibility and live up to its potential only if it relies on robust institutions, solid projects and programs, and accurately monitored results. The GIS proceeds can lower investment barriers, refurbish deteriorating plants and pipelines, and create incentives for the private sector to implement clean projects.

Private sector involvement must be based on a transparent selection process that clearly spells out the criteria under which a project qualifies for government support. New Zealand's Projects to Reduce Emissions (PRE) is a pioneering example of how a seller government has allocated AAUs to private entities as a reward for implementing projects that reduce GHGs. Although New Zealand and Ukraine are on different sides of the AAU equation—Ukraine will have a surplus and New Zealand will like become a net buyer—this example shows how to create an incentive framework for private sector projects.

In overview, the PRE was designed to support projects that reduce New Zealand's GHG emissions by awarding AAUs to participating projects in return for emission reductions. There have been two rounds of tenders—end of 2003, and end of 2004. To facilitate tender submissions, the New Zealand government published a list of emission factors for fossil fuels, electricity displacement, and embodied emission factors for cement, iron and steel, and aluminum industries. Project developers used the lists to calculate the emission reductions their projects could generate

To be eligible to tender, a project had to take place in New Zealand and the following:

- Contribute to reducing total GHG emissions that New Zealand would report in its National Greenhouse Gas Inventory for the first commitment period.
- Provide a minimum reduction of 10,000 tonnes of CO₂-equivalent (tCO₂e) emissions in the first commitment period.
- Result in measurable emission reductions that would not have occurred without the PRE incentive. Project proposals had to undergo an investment assessment to confirm that they were additional to "business-as-usual" (investment additionality), and an environmental assessment to determine the level of emission reduction beyond "business-as-usual" (environmental additionality).

- Meet the condition that each AAU the project sponsor requested had to be less than or equal to each tCO_{2e} expected to be generated by the project.

Forest sink activities and projects involving sequestration using land-use change and management activities were not eligible. To receive ERUs rather than AAUs, the project had to meet all eligibility requirements for a JI project under Article 6 of the Kyoto Protocol, and pay all costs to achieve the transfer, including costs of verification and public information.

Eligible projects were assessed for risk of failing to deliver expected emission reductions, including risks associated with the project owner, technology, resources, and economics. Successful projects were then selected for a second tender based on the ratio of AAUs requested to emission reductions expected during the first commitment period; and lower risk assessment ratings.

Project Risk Assessment. During the first tender, projects that contributed to electricity security were ranked higher than those outside the electricity sector, and pre-2008 reductions were recognized; during the second tender these criteria were dropped.

Subject to assessed risk, highest-ranked projects were those that offered most emissions reductions for the fewest AAUs. During the first round, all projects bid on a ratio of 1 tCO_{2e} reduced:1 AAU; during the second round, the average ratio was 1.0:0.8. Projects were awarded only up to the number AAUs requested in their tender application.

Through the two tenders, 10.9 million AAUs were allocated to 42 projects including 13 wind farms, 12 hydro projects, 6 bio-energy projects, 5 landfill gas projects, 4 geothermal projects and 2 co-generation projects. If fully implemented, these 42 projects will reduce 11.9 million tCO_{2e} during 2008-12 and contribute an additional 840 MW of electricity-generation capacity in New Zealand.

Lessons Learned from tendering process. The first tender for 4 million AAUs attracted 46 bids forecast to deliver a total of 15.9 million emission reductions until 2012. Project proposals included wind farms, hydropower, cogeneration, landfill gas and capture and electricity generation, bio-fuel and bio-energy, and waste treatment projects. No tenders were received from the transport sector (fuel, efficiency or modal choice), related to energy conservation, micro-scale energy generation, or small business projects. A barrier to entry may have been the minimum threshold for projects; and favoring projects that promoted electricity generation and energy security may have been a deterrent to other sectors and a deterrent to competitive ratio bidding amongst electricity projects because they already had a competitive advantage.

Since AAUs were being issued only for 2008-12, pre-2008 emission reductions were not recognized in the second round, to avoid discrimination against larger projects that had more lead time to generate emission reductions; this was also seen as a deterrent to competitive bidding.

The estimated value of AAUs and ERUs at the time of the first tender was €5.60. When used in the investment additionality analysis, projects had to be economically viable in their own right but remain uneconomic even with the AAUs or ERUs. This narrowed the range of eligible projects, and small shifts in a project's economic circumstances could change the additionality assessment. The low price and uncertainty over entry into force of the Kyoto Protocol was also seen as a disincentive to competitive bidding, as projects sought as many AAUs as possible to be viable.

Lessons Learned from the 2005 independent review of PRE. The Government of New Zealand commissioned an independent consulting firm (Allen Consulting Group) to review the success of both tenders. Allen Consulting Group measured the "success" of PRE on the basis of whether the projects would generate a 1:1 ratio of emission reductions generated to AAUs (or ERUs) delivered to the project developers. Much analysis focused on whether projects were in fact additional, on baseline calculations, and concerns that projects may not be implemented. The key findings of the review were as follows:

- The PRE was designed as a competitive bid to provide the minimum support for project viability. However, identifying projects at the margin (i.e., those projects that achieve maximum cost-effectiveness) is difficult and requires considerable judgment. While PRE was targeted at these projects, it was difficult to identify and focus on them. Assessing project baselines was considered difficult, and there was concern that some project developers were able to "game the system".
- PRE's additionality test was considered "best practice" in how it incorporated mechanisms to minimize AAUs being awarded to projects that were viable in their own right (i.e., strictest financial additionality test).
- Choices over additions to New Zealand's electricity supply are increasingly between competing renewable technologies. As a result, New Zealand decided that new renewable energy projects should not be additional, as most new generation is expected to come from renewable sources.

Allen Consulting concluded that emissions reductions associated with PRE were achieved at a cost (on average) greater than the Kyoto price—i.e., the Government of New Zealand will issue more AAUs or ERUs than actual emission reductions generated when calculated *ex post* using very strict financial additionality criteria. The quality and types of projects submitted may have been reduced by general lack of understanding in the New Zealand market of the rules and opportunities for participation.

Allen Consulting recommended not taking the program forward unless it excluded electricity-generation projects, strengthened baseline assessments and the additionality test, among other changes. Allen Consulting's conclusions need to be analyzed in the context of the New Zealand government's objectives.

Application of PRE to Ukraine. New Zealand's PRE exemplifies how to create an incentive framework for private sector projects. Regardless of program objectives, the

mechanism for selecting private sector projects could be easily transferred to Ukraine. Eligibility and evaluation criteria help ensure projects quality and hedges the risk of awarding AAUs to projects that fail to meet overall government objectives.

However PRE highlights the importance to project selection and evaluation of well-designed objectives and criteria. Given Ukraine's expected AAU surplus, a GIS framework could be designed to support projects beyond the allocation of AAUs (or ERUs) through, for example, support for feasibility studies and preparing project design documents. Linking program success to the ratio of "actual" emissions reductions expected against AAUs or ERUs issued to projects may be less important in Ukraine when other environmental benefits are taken into account. Also, in the context of a GIS, environmental additionality may be a credible alternative to the strict financial additionality test used in PRE.

Annex F. Transaction Risks and Mitigation

Ukraine's Risks

<i>Risks/Factors</i>	<i>Potential Impact</i>	<i>Risk Assessment</i>	<i>Risk Mitigation</i>
A. Transfer Risk: Eligibility for Article 17 Emissions Trading	No transfer of AAUs possible (seller's responsibility)	Evaluate Ukraine's current status in meeting Article 17 eligibility criteria Continuously monitor Article 17 eligibility criteria Evaluate Ukraine's institutional capacity	Achieve and maintain Art, 17 eligibility Sustain funding for responsible institutions Establish central AAU management function Establish early warning systems for loss of eligibility for AAU trades Establish AAU reserve outside of Ukraine Enter into a guarantee agreements with other Annex-1 country(ies)
B. Payment and Resource Risk: Buyer fails to make (timely) payment	Delay in receiving payments	Assess consequences of delayed payments on Ukraine's ability to generate emission reductions	Establish default provisions and remedies Hedge risks through standby letters of credit or other guarantees provided by commercial banks
C. Price Risk: Volatile price in AAUs	Price increase or decrease	Assess carbon market Develop carbon strategy factoring price and timing of AAU sales Test market with pilot transaction (s)	Negotiate price structures with differentiated prices linked to triggers affecting market price Maximize advance payments Select fixed price contracts (if prices are high) Impose margin payments on forward buyer if price falls
D. Counterpart Risk under the GIS	Project sponsor fails to implement project/generate greening	Evaluate project sponsor's financial and institutional capacity Develop greening criteria and strictly apply. Conduct due diligence of commercial project agreements Assess financial liabilities of government	Develop contractual arrangement with the project sponsor Diversify project pool/portfolio Pay only on delivery of greening Rely on proven programs
E. Risk related to the GIS financial manager	Failure to deliver greening	Stringent criteria to appraise and procure GIS manager	Establish contractual (performance-based) management Establish supervisory (board) Monitor and report on financial flows and status
F. Indemnities and Liabilities under the GIS	Financial risk of the government of Ukraine	Assess government guarantees and step-in obligations of GIS Assess Government liabilities to AAU buyers	Stringent design of the GIS and all underlying agreements

Buyer's Risks

<i>Risks/Factors</i>	<i>Potential Impact</i>	<i>Risk Assessment</i>	<i>Risk Mitigation</i>
A. Transfer Risk: Eligibility for Article 17 Emissions Trading	No transfer of AAUs possible (buyer's responsibility)	Independently evaluate Ukraine's eligibility status under Article 17 criteria	Establish reporting requirements Establish commercial risk guarantees and risk-hedging mechanisms
B. Price Risk: Volatile price in AAUs	Price increase (and decrease)	Assess carbon market Develop carbon strategy factoring different prices and timing for AAU purchases	Negotiate differentiated prices linked to market price triggers Pay on delivery Establish defaults and remedies
C. Implementation Risk	Failure to deliver greening	Appraise GIS management Assess GIS implementation capacity Conduct sector analysis of investment opportunities	Pre-appraise investment opportunities Buy from diversified portfolio of projects Report, monitor, supervise Independently verify Establish contractual remedies against the seller

AAU DELIVERY RISK

There are three main types of AAU delivery risks:

- Ukraine cannot transfer assigned amount units because it is not eligible.
- Ukraine is eligible but fails to deliver assigned amount units because Government (and therefore policy) has changed, or because the responsible entity fails to meet an AAU delivery deadline.
- Assigned amount units are not delivered due to UNFCCC or other third party technical failure.

Regulatory risk will remain because eligibility can be lost at any point during the first commitment period if Ukraine falls out of compliance with the requirements for international emissions trading. Already-transferred assigned amount units will not be affected by non-compliance but forward contracts will.

Risks associated with Ukraine failing to deliver assigned amount units due to changes in political direction or domestic legislation will affect both spot contracts and forward purchase contracts. However, this risk can be mitigated by using escrow accounts to hold reserve assigned amount units in one or several countries with functioning registry systems and little compliance risk. The reserve could be a source of replacement assigned amount units or income if buyers seek damages or refunds for advance payments. Ukraine could also mitigate this form of delivery risk through financial guarantees to the buyer or by offering political risk insurance.

Failure by a third party or the UNFCCC would probably count as *force majeure*.

Contracts will contain remedies that the buyer can exercise in the event of delivery failure. Contracts for certified emission reductions and emission reduction units typically include, for example, delivery of replacement units, damages, and reimbursement of advance payments.

GREENING DELIVERY RISK

Two main risks could affect Ukraine's ability to deliver greening: (a) AAU payment beneficiaries fail to implement greening activities and (b) Ukraine fails to monitor and verify greening. The greening risk could be mitigated by selecting projects and programs that are high quality, well prepared, well managed, properly funded, and closely monitored. A portfolio of diverse projects and programs could also reduce the greening risk.

Ukraine could hire managers to oversee greening of the project portfolio to ensure that greening is monitored and verified. Alternatively GIS management or programs could be outsourced to independent or private entities to create incentives to reduce greening risks. These entities would be responsible and therefore liable for damages if greening does not take place. Selecting an appropriate incentive structure and supervision arrangements will be key in ensuring the success of this approach. Similarly project owners receiving GIS funds could be held financially responsible for greening.

Failure to fulfill greening commitments may result in penalties to Ukraine or in adjustments to AAU unit price, or damages, representing the difference in value between greened and non-greened assigned amount units.

MARKET RISK

Future value of assigned amount units is difficult to assess due to the many uncertainties surrounding the AAU market and greening. Ukraine could achieve some certainty by fixing the AAU price in a forward contract, removing exposure to market fluctuations; however while this avoids losses, it also prevents increases.

Ukraine could also consider a variable price arrangement under which AAU price is adjusted if the market price of assigned amount units is significantly lower or higher than a fixed price. If this also included a guaranteed floor price, Ukraine would be protected from a dramatic price collapse, but this benefit would have an implied cost in transaction pricing.

Regardless of sales arrangements, political risk remains. Under a fixed price deal, Government could be criticized if the price later rises; under a variable price arrangement, Ukraine could be criticized if the price falls. Communication, documentation, education, and an attempt to achieve consensus can mitigate this risk. Also, the benefits realized from use of proceeds can help deflect criticism of the terms of the transaction.

Annex G. Potential AAU Buyers and Sellers

This Annex reviews World Bank consultations with potential buyers and sellers of AAUs on engaging in AAU transactions and participating in GIS.

AAU TRANSACTIONS AND GIS

In March and May 2006, the World Bank invited governments participating in World Bank-managed carbon funds to informal meetings to evaluate their appetite to engage in AAU transactions and participate in GIS. Potential buyers and sellers were still engaged in internal discussions and no definitive policy stance had been taken by either. Based on discussions several issues were resonant although there was no consensus.

- **Purchasing AAUs for compliance:** Most countries expecting a deficit in meeting their emission reduction commitments are likely to purchase AAUs from economies-in-transition. Public acceptability will likely require that these purchases be “greened”.
- **Greening AAUs:** The type of greening can be flexible and could include projects and programs with environmental benefits other than GHG emission reductions. Buyers prefer some separation from “traditional” JI projects. Some buyers were open to the possibility of combining a JI project with AAU transfers for emission reductions generated outside the first commitment period.
- **Green Investment Schemes:** Proceeds from the AAU sales would need to be disbursed through a GIS established in the seller’s country and sellers should take the lead in defining GIS scope and selecting projects.
- **Management, legal and institutional issues:** Transparency and accountability is critical in the use of AAU transaction proceeds. The GIS-implementing agency must be credible, transparent, and reliable. Some buyers may want to participate in the fund oversight mechanism.
- **Monitoring:** Participants considered strong monitoring important, especially oversight of financial flows and environmental benefits arising from GIS-supported projects and programs. Sellers preferred that monitoring environmental benefits be specific to the sector, rather than linked to emission reduction measured against some baseline standard, as in JI track two.
- **Additionality of AAU proceeds:** Concern was expressed about how to demonstrate that funds provided were additional—not a substitute for normal budgetary funds. Earmarking AAU revenues could help address this issue. However, earmarking triggered discussion of undesirable budgetary practices.

- **Sequencing AAU purchases:** A major issue is sequencing delivery of AAUs and the implementation of greening. Buyers are flexible on timing but need assurance that AAU sales proceeds are spent as agreed.
- **AAU pricing:** There is no precedent for AAU pricing. Some buyers prefer transparent pricing—public tendering or auction—rather than price setting through bilateral negotiations. Some buyers cannot participate in public procurement and would need an intermediary to negotiate price and funding.
- **Private Sector Role:** The potential for private sector participation has not yet been deeply explored. However, some emerging ideas include private sector financing or parallel financing of upfront investment costs; a guarantor of green funds performance; even an interim “holder” of AAUs before they are transferred to governments.
- **International Financial Institutions:** International financial institutions should assist seller countries with the transaction to facilitate transactions without self-interest, thereby lending impartiality and credibility to a GIS.

Annex H. Ukraine's Greening Potential

This Annex provides an overview of the greening potential and barriers to investment in nine emission-intensive sectors of the economy.

Greening potential is based on the greening criteria proposed in Section 6 of the main report but these are provided for illustrative purposes only. Ukraine will need to prioritize greening activities by selecting its own criteria, perhaps in conjunction with potential buyers, on a project-by-project basis. This section is not an exhaustive survey of greening options and does not identify specific projects.

The sector survey looks at investments that reduce GHG emissions but the scope for greening could be broader and, depending on how a GIS transaction is structured, may be partly determined by the buyer. For example, reducing pollutants other than GHGs; building capacity for GIS institutions; environmental monitoring and verification; financing the GIS itself; adapting to climate change

FUEL EXTRACTION, PROCESSING, DISTRIBUTION, AND TRANSIT

Total primary energy consumption in Ukraine was largely based on gas (41 percent), coal (25 percent) and crude oil (18 percent) in 2003. Nuclear accounted for 15 percent of national energy consumption. The share of other energy sources, including renewables, lies below 1 percent. About half of Ukraine's total energy consumption is imported (Figure H1).¹ Ukraine is particularly dependent on imports of gas (72 percent)² and crude oil (84 percent) although the share of imported coal is low at 7.0 percent. The net value of energy imports to Ukraine equals 16 percent of GDP.³

Energy security is a key concern for Ukraine with imported gas making up about 38 percent of the country's primary fuel consumption, high energy intensity, increasing gas prices and implicit subsidies running at about 6.0 percent of GDP. Policy measures, diversification of energy supplies and energy efficiency measures can all increase Ukraine's energy security.

There are ample opportunities for improvement in the efficiency of Ukraine's energy sector where 29 percent of supplied energy is lost during distribution and conversion, mainly due to obsolete equipment. For example, coal conversion processes consume 7.0 percent of the total primary energy supply.

¹ International Energy Agency (2006) 2003 Energy Balances for Ukraine.

² Fox Davies (December 2005) Ukraine Oil and Gas Sector Overview.

³ World Bank (6 December 2005) Ukraine: Impact of higher natural gas and oil prices.

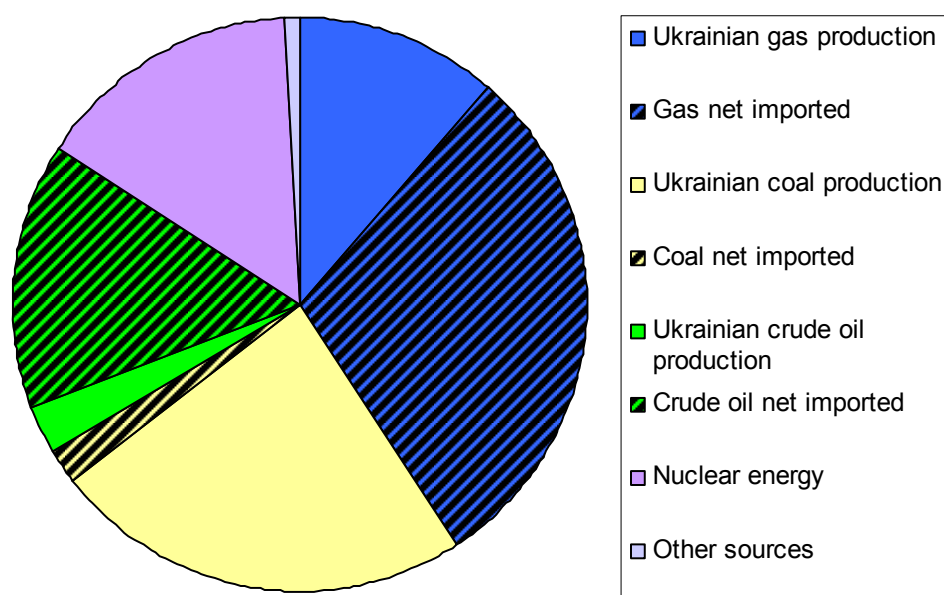


Figure H1: Consumption of energy carriers as a share of total primary energy consumption in Ukraine in 2003. Shaded areas indicate net imports.

The GHG emissions in the energy sector are high at 132 Mt in the gas sector, 28 Mt in the coal sector and 0.042 Mt in the oil sector in 2003.

Table H1. Emissions from fuel extraction, processing, distribution and transit

Activity	GHG emissions (Mt CO ₂ e)	Contribution to overall emissions (%)	
		Ukraine	EU-15
Gas transit	73.3	14.6	0.5
Fugitive emissions from Natural Gas Production	29.5	5.9	
Fugitive emissions from Natural Gas Distribution	29.3	5.8	
Fugitive emissions from Underground Mining Activities	25.8	5.1	0.4
Manufacture of Solid and Liquid Fuels and Other Energy Industries	10.7	2.1	4.5
Total	168.6	32.0	5.4

Note. Information is based on the Ukrainian and EU inventories. GHG emissions in Ukraine amounted to 527 Mt CO₂e in 2003, compared to 4,007 Mt CO₂e in the EU-15. The information on the emissions in the EU-15 enables a comparison between Ukraine and the EU. In cases where the breakdown of sector emissions to economic activities differs between Ukraine and the EU-15, only aggregate data on sector level or a number of economic activities combined are presented.

Gas. Ukraine is well situated on the East-West gas transport corridor and the transmission system is a strategic asset that generates US\$1.5 billion per year in revenues.⁴ However, a significant volume of GHG emissions arise during gas transit and compression; fugitive emissions from the gas sector are responsible for 32

⁴ World Bank (September 2003) Ukraine: Challenges Facing the Gas Sector.

percent of Ukraine's GHG emissions, which rose sharply during 2003-06. About 7 BCM of gas is consumed during transmission whereas 3 BCM is considered sufficient for a system of a similar size and design.⁴ The World Bank estimates that gas distribution network losses were around 1.6 billion m³ ("BCM") in 2002⁵. Consequently the gas sector is an important target for emission reductions and climate policies; investments could significantly increase Ukraine's headroom and prevent further increases of GHG emissions against the 1990 baseline.

Naftogaz produces over 95 percent of Ukraine's gas; it controls and manages the gas transit network, and handles nearly all imported gas.⁴ However, the company lacks strategic investment reserves and was the largest single tax debtor in Ukraine in 2002.⁴ Rising gas prices make transit losses a potentially valuable source of savings estimated at around US\$0.5 billion per year or between 19 and 24 Mton of CO₂e per annum.⁶ However, higher gas prices could also lead consumers to switch to coal, which is cheaper, domestically available, but much more carbon-intensive. The carbon intensity or extensity of a fuel refers to the CO₂ emissions per unit of energy.⁷

Reliance on imported gas could be reduced by developing domestic gas production. An increase of 10 to 12 billion m³ per year, an amount equal to about 15 percent of the country's consumption⁴, is possible with an investment of about US\$1.5 to 2.0 billion. This could also displace more carbon-intensive fuels such as oil or coal while reducing GHG emissions.

Coal. Ukraine produces about 57 million tons of coal per year. However coal use is likely to rise in the future due to pressures to diversify energy sources and reduce dependence on gas imports. Most equipment used in the coal sector is obsolete, management practices are inefficient, and many mines have operated for 20 years without rehabilitation. About 15 percent of available coal reserves are lost during coal bed development due to difficult geological conditions, inadequate planning, and out-of-date technologies. The coal sector generates around 88 percent of waste from all sources.⁸

Capital investment could improve extraction practices but AAU buyers may be less interested devoting proceeds to this carbon-intensive sector unless a concerted effort is made to support cleaner coal production and to reduce GHG emissions, for example, by substituting coal mine methane (CMM) as a fuel for coal-fired installations. Greenhouse gas emissions from coal mine methane are significant and amount to between 0.8 to 2.7 billion m³/year.⁹ In the largest coal basin in Ukraine, the

⁵ The transit of Russian gas through the country in that year was about 120 BCM and domestic consumption about 69.8 BCM.

⁶ This figure is based on a methane density of 1400 m³/ton and the methane content of the natural gas varying between 100 and 80 percent. The GWP of methane is 21.

⁷ For an overview of the carbon emission factors of different fuels see the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, page 1.12..

⁸ Olena Stephanska, (2006) US Commercial Service.

⁹ Ministry of Fuel and Energy of Ukraine, Energy Strategy of Ukraine up to the year 2030, Kiev 2004.

Box H1. The Partnership for Energy and Environmental Reform (PEER)

In 1998 the US EPA supported a project in Ukraine's coal sector: the Partnership for Energy and Environmental Reform (PEER). This initiative provided technical assistance to the coal sector including techniques for the extraction and use of CMM. The PEER assessed the CMM potential of a large number of Ukrainian mines and developed business plans for CMM projects. It also organized seminars and training on methane extraction and combustion technologies and safety practices used in the US. The PEER succeeded in implementing several pilot-scale CMM projects.

Donetsk basin, the amount of methane emitted per ton of coal extracted is relatively high (about 25 m³/t).¹⁰

Greening opportunities in the fuel and energy sector. The Ministry of Fuel and Energy of Ukraine made the following specific suggestions for greening activities:

- Modernize and improve the efficiency of gas compressor units in strategically important gas transport networks such as UPU, 'Progres,' 'Souz,' EKRR;
- Facilitate the use of unexploited energy sources like waste energy from thermal energy exhausts of gas compressor units, surplus pressure at gas distribution stations, and ill-conditioned (wasted) gas at oil-and-gas wells.

The AAU proceeds could also support the fuel and energy sector indirectly by helping alleviate the effect on vulnerable industries by for example, providing capital for investments in energy-efficiency improvements. However, Ukraine must avoid creating structural subsidies from GIS funds for energy-intensive industries; market distortions might be minimized by providing soft financing for investments, support for feasibility studies and pilot projects, or venture capital.

AAU proceeds could help reduce waste streams and improve waste management or support CMM project development in the coal sector. Feasibility studies conducted with support from the US Environmental Protection Agency and confirmed by other sources, indicate that viable business opportunities exist in Ukraine for CMM project development.¹¹ Such investments could potential be enhanced by GIS, JI, or both.

¹⁰ The First National Communication on Climate Change, Kyiv, 1998.

¹¹ Partnership for Energy and Environmental Reform (2000) Coal Mine Methane Recovery in Ukraine: Business Plan for a Development Project at Skochinsky Mine; Partnership for Energy and Environmental Reform (2000) Coal Mine Methane Recovery in Ukraine: Business Plan for a Development Project at Komsolomolets Donbassa Mine.

Table H2. Investment and greening options in the coal and gas sectors

<i>General investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Encourage fuel switch from coal and oil to natural gas by developing domestic gas fields.	Access to capital. Financial viability and structure of the gas sector.	Provide technical assistance to identify and develop projects. Use GIS revenues to invest in Develop domestic energy sources, which may allow a fuel switch to less carbon-intensive fuels if AAU buyers will support such greening.
Reduce emissions from gas transit, gas distribution, and oil extraction; improve efficiency of gas compressor stations; exploit the use of waste energy.	Governance Access to capital Low energy prices Failure to attract FDI Commercial losses	Provide investment capital for energy efficiency measures. Provide technical assistance to identify and develop projects; provide investment capital.
Improve extraction and management practices in the coal sector.	Access to capital. Low energy prices. Failure to attract FDI	Provide technical assistance to identify and develop projects, and to improve coal extraction; seek prior approval from AAU buyers.
Reduce CMM emissions; develop as a carbon extensive energy source. Reduce mining waste	Access to capital. Low energy prices Failure to attract FDI Limited exposure to competitive markets	Provide technical assistance to identify and develop projects; provide investment capital. Improve coal extraction practices and reduce mine waste.

IRON AND STEEL PRODUCTION

Although the Ukraine steel sector is the second only to the energy sector as the largest producer of GHG emissions, it is one of the most promising sectors for private sector investment because spectacular export growth has driven steel prices up. Demand from China has doubled and demand from Russia and the domestic market has increased; in 2004, the sector's production capacity was 43.5 Mt, more than half of which was exported (around 25 Mt). The (re)privatisation of Ukraine's large steel mills has triggered energy efficiency and modernisation initiatives.¹² A paper from the Ministry of Industrial Policy shows that investments are being made in the sector, indicating that not all companies in the steel sector face capital constraints.

Table H3. 2003 emissions from iron and steel production

<i>Activity</i>	<i>GHG emissions (Mt CO_{2e})</i>	<i>GHG emissions (% of total)</i>	
		<i>Ukraine</i>	<i>EU-15</i>
Fuel combustion: Iron and Steel Industry	66.2	13.2	0.4
Iron and Steel Production	30.1	6.0	
Total	96.3	18.3	0.4

¹² EBRD web-site: www.EBRD.com, last visited at 10 July 2006.

The iron and steel sectors are reacting to rising gas prices by seeking energy efficiency improvements to reduce annual gas consumption, including changing existing production lines from open-hearth to converter processes (1.4 bcm reduction); using blast furnace cast-iron processes, and improving production processes (2.6 bcm reduction); and re-using coke oven or blast furnace gas.

Table H4. Investment and greening options in the iron and steel sectors

<i>General investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Improve efficiency of production; exploit the use of waste energy.	Governance Limited capacity Awareness of new technologies	Provide technical assistance to identify and develop projects; provide investment capital. Support energy audits.
Improve environmental performance in the sector.	Limited capacity Lack of awareness	Provide technical assistance to identify and develop projects Provide training and raise awareness

The AAU proceeds could support energy audit and project development services, business plan development, Project Design Document (PDDs) preparation; support for other environmental improvements; or early or late crediting for JI projects facing other barriers. For example, JI alone may not be sufficient to stimulate investments in the area of steel recycling. Pilot projects to demonstrate the viability of recycling could therefore be an interesting greening opportunity under a GIS.

Power and heat production. Heat and power stations are the third largest source of GHG emissions in Ukraine, where they are treated as a single sector in the national registry. From Figure H2 it becomes clear that most coal plants provide both heat and power (CHP), whereas the gas plants generally produce one or the other. CHP plants are an efficient way of producing power and heat.

Table H5. 2003 emissions from power and heat production.

<i>Activity</i>	<i>GHG emissions (Mt CO_{2e})</i>	<i>GHG emissions (% of total)</i>	
	Ukraine	Ukraine	EU-15
Fuel combustion: power/heat production	89.2	16.9	25.6

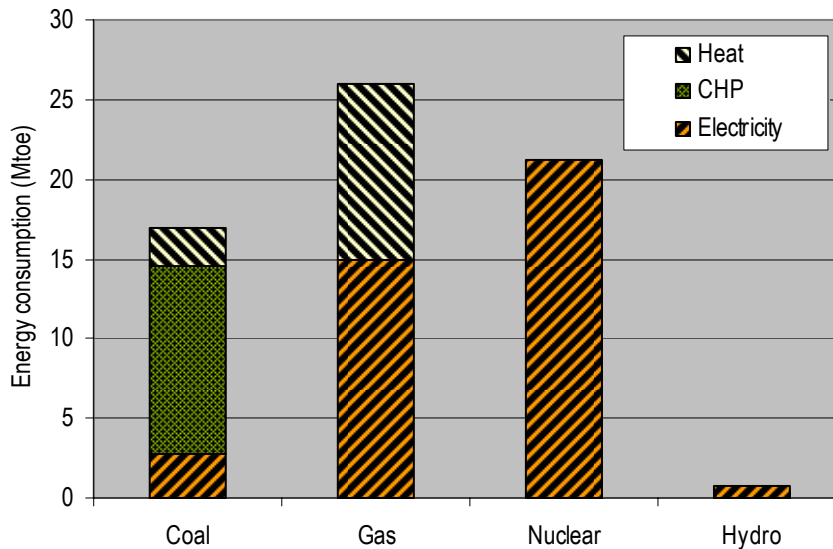


Figure H2. Energy consumption by source: heat, power and CHP plants in 2002.

Power sector. Thermal power units in Ukraine need extensive repair and rehabilitation. Breakdown of boilers, lack of fuel supply during peak demand, and poor fuel quality create an unreliable power supply due to regular downtime. Poor installations create relatively high power plant GHG emissions.¹³ Grid losses are up to 14.9 percent of the power supplied, 2.5 times higher than in industrialized economies.

Ukraine has partly liberalized its power sector. The high voltage transmission system and most hydro and nuclear power plants are mainly in state hands. About half of the oblennergos¹⁴ (distributing about 30 percent of power in Ukraine) and one generation facility have been privatized; operational efficiency has improved, technical and commercial losses have declined, liquidity and payment collection have risen.¹⁵

Although electricity tariffs are still regulated, consumers can choose among power suppliers according to a single wholesale buyer-seller model.¹⁶ The National Electricity Regulatory Committee (NERC) reviews all major purchases, contracts, and distribution asset investments, and regulates distribution and consumer tariffs. Unfortunately NERC lacks sufficient funding to undertake its tasks.

In 1996, the president of Ukraine issued a decree for the development of wind energy as a national priority area. Later also a subsidy scheme for the construction of wind power was developed in combination with a special tariff for electricity from wind power. In 2001, the Cabinet of Ministers of Ukraine adopted a resolution for the

¹³ Thermal Power Plant Emissions, World Bank, 2004.

¹⁴ Oblennergos are regional distribution companies.

¹⁵ World Bank (November 2004) Ukraine: Key Challenges Facing the Electricity Sector,.

¹⁶ CIS ECP/ EURELECTRIC (November 2005) Comparison of the EU and CIS Electricity Markets, Brussels.

development of geothermal power.¹⁷ Other potential sources of renewable energy are hydropower, with the potential to double the existing 10,000 GWh production, and biomass.

Box H2. Government incentives to stimulate renewable energy and energy efficiency

The Ukrainian government adopted laws and resolutions to stimulate renewable energy and energy efficiency. The law on electrical energy introduced a 0.75 percent charge on the electricity tariff, revenues that the Ukrainian government will direct to a state fund to stimulate wind energy. On 24 June 2003 an order from the Ministry of Industrial Policy directed the accumulated financial means in the state fund to the state scientific enterprise “Ukrenergomash” for the implementation of the special Program on Wind Power Stations Construction from 1997. This resulted in the installation of 53 MW wind power.

Source: EBRD Renewables, Ukraine country profile, www.EBRD.com, last visited at 4 July 2006.

District heating. The district heating systems in Ukraine are potentially energy efficient and cost-effective but an investment backlog of around US\$7 billion has seriously undermined their potential—heat distribution losses can reach 50 percent. Better demand-side management is urgently needed and the section on the residential and services sector will elaborate on this.

Although raising energy tariffs can improve energy sector financial standing and create incentives for energy efficiency, increased tariffs may hurt vulnerable end-users such as energy-intensive industries or poor households. Funds are available through existing programs to mitigate users’ increased costs but beneficiary selection has been ineffective.

Greening opportunities in the power and heat production. The Ministry of Fuel and Energy of Ukraine supports the use of AAU proceeds to realize energy saving projects that improve combustion of fossil fuels at thermal generation plants. AAU proceeds might also be used to stimulate investments in renewable energy sources, to improve the efficiency of power and heat generation and to encourage a fuel switch to cleaner fuels.

¹⁷ Cabinet of Ministers Ukraine, Resolution on a program for geothermal in Ukraine, 27 December 2001.

Table H6. Investment and greening options in power and heat production

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Stimulate development of renewable energy sources	Power generators' poor financial standing and limited ability to attract investment.	Provide investment capital.
Improve power generation efficiency (for example by introducing combined cycles and more CHP plants).	NERC slow to approve investments Electricity price barely covers operation costs, much less, investments. Privatisation is slow	Provide technical assistance to identify and develop projects, seek financing, carbon finance. Assess the performance of existing laws and regulations to stimulate investments in efficiency improvements and renewable energy. Provide staff training in developing business plans, feasibility studies, and attracting financing.
Improve the efficiency of heat generation	Poor financial standing of municipal heating systems inhibits investment Electricity price barely covers operation costs, much less, investments. Slow pace of privatisation	Provide technical assistance for project identification, project development, financing, carbon finance.
Encourage fuel switch from coal and oil to natural gas	Increased use of imported gas undermines energy security of Ukraine Gas costs more than coal.	Avoid increased gas imports by supporting domestic gas field development to support a fuel switch.

Industrial Production. The industrial sector is the fourth largest source of emissions in Ukraine; almost 99 percent of industrial sector GHG emissions are from CO₂. However, CH₄ and N₂O emissions are tiny, even from typical processes such as adipic acid production. IEA statistics indicate that the sector as a whole consumes 18 percent of total coal and 17 percent of total gas—domestic and imported.

Ukraine's industrial sector has been largely privatized and as energy prices continue to rise investments in energy efficiency will be a strategic priority. Some industries invest in their own power and heat supply to avoid power or heat supply distortions that can inflate production costs. Some industries also have an interest in reducing their dependence on external power supply.

The Ukrainian government aims to assist industry to comply with European environmental standards. Such compliance requires investments, which can reduce GHG and other emissions. The 2nd National Communication from Ukraine states that energy efficiency measures have the potential to reduce emissions by about 80 million tons CO₂ per year. The investment needed is EUR 15 billion.

Table H7. 2003 emissions from industrial energy use

Activity	GHG emissions (Mt CO ₂ e)	GHG emissions as % of total	
		Ukraine	EU-15
Fuel Combustion in Manufacturing Industries and Construction. Other.	15.0	3.0	
Ammonia Production	7.2	1.4	
Fuel Combustion. Food Processing, Beverages, and Tobacco	6.5	1.3	
Fuel Combustion. Other sectors. Commercial	6.4	1.3	
Fuel Combustion. Chemical Industry	4.6	0.9	
Total	48	9.0	23

Box H3. Greening industrial modernization

World Bank developed a framework to assist Ukrainian industry comply with European environmental standards. The project “Greening Industrial Modernisation” (GIM) aims at using revenues from the sale of AAUs for investments in the Ukrainian energy sector. Greening activities cover the implementation of projects at Ukrainian industries as well as the management of a proposed industrial window in a national Green Investment Scheme. GIM will include cover three core activities:

- Establish and manage a ‘Ukrainian Industrial Carbon Fund’ (UICF);
- Develop a portfolio of emissions reduction projects in industry;
- Monitoring and verify emission reductions.

Industrial sector spans a range of activities requiring different approaches to identify and develop greening projects. In some cases, the largest emission reduction potential lies with other companies in the supply chain rather than with the industrial facility itself. The following are some ways to identify emission reduction opportunities.

- Environmental impact assessment,
- Life cycle assessment,
- Environmental technology assessment
- Pollution and waste audits
- Environmental management accounting¹⁸

Developing different methods for project identification and environmental management is an investment opportunity for GIS. Education and capacity building aimed at managers and consultancies could also stimulate initiatives from industry itself. Ukraine could allocate GIS revenues to support projects whose emissions reduction occurs at other companies than the ones that make the investment. Lack of ownership of the emission reductions makes it difficult to claim reductions under JI and GIS investment capital for could be an option.

¹⁸ United Nations Environment Program, Environmental Management Tools -Supply Chain Management-, UNEP web-site: www.unep.org/pc/pc/tools/, last visited on 2 July 2006.

There are also many ways to reduce consumption of energy, raw materials, and production of waste.

- Supply chain management
- Environmental management systems
- Extended producer responsibility
- Product service systems (including ecodesign)²⁴
- Recycling,
- Industrial symbiosis ¹⁹

GIS revenues can potentially be invested in ESCO initiatives. This ESCO can include demand-side management, supply-chain management and industrial symbiosis. If projects reduce emissions of GHG an ESCO initiative or individual projects under an ESCO could maybe also apply for JI status, based on either one project or a portfolio of projects.

Table H8. Investment in greening options in industrial energy use.

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Apply GIS revenues to alleviate effects of rising energy prices on vulnerable industries	Accurately defining 'vulnerability' of a company to energy prices Selection systems could have high potential for corruption	Provide financial support to vulnerable industries to invest in reducing their energy consumption. Avoid long-term structural subsidies.
Increase use of scrap, cullet, and other recycled materials	Limited capacity for recycling and waste sorting Need to create public awareness	Provide soft financing or grants for projects facing high capital investments; provide risk capital for investments; finance feasibility studies, research or pilot projects.
Introduce demand-side management	May reduce demand for certain products, which could deter supplier cooperation Business relations with potential suppliers may be insufficiently stable to develop options Companies may be reluctant to share information crucial for effective industrial symbiosis Emission reduction may be achieved at the premises of a different company, which may raise legal questions of emission reduction ownership	Develop advice structures to identify and develop projects Support financing of projects . One could aim at projects that reduce emissions at companies other than the investing company.
Introduce supply-chain management		
Introduce industrial symbiosis		
Introduce or expand the ESCO concept	The ESCO concept may not be self-supporting	Use GIS funds to support ESCOs. Expand the ESCOs concept to projects aimed at reducing use of (raw) material, or general environmental

¹⁹ National Industrial Symbiosis program, NISP web-site: www.nisp.org.uk, last visited at 3 July 2006.

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
		management.
Improve environmental performance and monitoring	Lack of capacity Lack of resources Lack of awareness	Support project development Develop tools to monitor and verify emission reductions Education and capacity building

The EBRD granted a US\$30 million loan to establish an Energy Service Company (ESCO) in Ukraine to identify and implement energy saving investments. The beneficiary of the loan was the State Committee for Energy Conservation. In 2005, the EBRD signed a second agreement for US\$20 million. The client of that loan was the state-owned joint stock company UkrEsco. The projects of UkrEsco demonstrate that the ESCO concept can be applied in a broad range of sectors:

- Improve heat generation at secondary schools
- Construct CHP plant at a leather production plant
- Improve heat generation and transfer at a dairy factory
- Introduce new technologies in agriculture to save fuel consumption

Residential Fuel and Energy Consumption. Residential sector emissions are significant at 8.4 percent of total emissions. As an important end-user of energy the sector has big emission reduction potential through demand-side management.

Table H9. 2003 emissions from residential fuel consumption.

<i>Activity</i>	<i>GHG emissions (Mt CO_{2e})</i>	<i>GHG emissions as % of total</i>	
		Ukraine	EU-15
Total	44.2	8.4	10.8

The residential sector together with the commercial and public services account for about 6.0 percent of total coal consumption and 32 percent of gas consumption. In addition, about 46 percent of heat from heating stations and 20 percent of power goes to the residential and services sectors. Heat, power and CHP plants in Ukraine together consume close to 50 percent of the country's annual coal and gas supplies.

Barriers to implementing energy efficiency measures in the residential sector are many: Households lack financial means even for simple repairs to their apartments; tenants are reluctant to invest in energy efficiency for a building they do not own; property owners lack incentives to invest since they do not pay energy costs.²⁰ In addition, mortgage markets are immature; banks lack experience with mortgage

²⁰ OECD Environment Directorate and the International Energy Agency (2003), Green Investment Schemes: Options and Issues, OECD Environment Directorate and the International Energy Agency, Paris.

lending; property rights are badly defined; low energy prices make energy efficiency payback periods too long; high taxes on energy-efficient products are a deterrent.²¹

Box H4. World Bank loan for district heating system rehabilitation

In 1999 the World Bank signed a US\$200 million loan for Kiyvenergo for the rehabilitation of the capitals District Heating system. In addition, the World Bank provided US\$18.3 million to the city for reforming communal heat supply, including a gradual transfer to consumption-based billing instead of billing based on characteristics of the apartment of consumers. The loan enabled an increase in heat tariffs and improved the collection rate from below 70 percent in 1997 up to one of 85 percent in 2000. The project also used a public awareness campaign with advertisements and commercials on radio and TV to explain the dynamics of fuel prices. The advertisements also explained the effect of a municipal heating service with a bad financial standing on its ability to provide services.

Energy efficiency in district heating systems

Ivano-Frankivsk is a project in which the district heating company introduced differential tariffs so that consumers with meters received a discount of 4 to 11 percent on their hot and cold water consumption, depending on the season. Also the district heating company introduced a peak demand charge that is paid monthly as a fixed rate and can be reduced if a building manager implements efficiency measures that reduce peak demand and has the reduction certified by a licensed energy auditor. The rationale is that it is usually cheaper to reduce consumption (lower the temperature) than it is to reduce peak demand (which requires investments in insulation, ventilation, heat recovery, etc.). Billing a constant monthly peak load charge also improves municipal heating utilities' cash flow.

Source: UNECE Energy Efficiency 21, web-site: www.ee-21.net, last visited at 6 July 2006.

Table H10. Investment and greening options in the residential sector.

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Differentiate prices between metered and non-metered consumers	Households are capital restrained	Finance household investments through micro loans Develop public awareness campaigns and education.
Introduce heating tariffs based on heating capacity and actual consumption to stimulate investments	Transaction costs may be high when external auditor verifies that investments reduce peak building load	
Raise energy tariffs	Vulnerable consumers may be disproportionately affected and unable to adapt	
Develop a specified ESCO concept aimed at the residential sector	Small target units make it difficult to keep transaction costs low.	Finance ESCO initiatives in residential sector.
Develop public information and education campaigns on energy efficiency options in heat and power use for residential users	Campaigns must be long-term to achieve long-term effects GHG effect is difficult to measure	Fund campaigns if power and heat companies do not take initiatives

²¹ Removing Barriers to Residential Energy Efficiency in Southeast Europe and the Commonwealth of Independent States, Alliance to save energy and the Renewable Energy and Energy Efficiency Partnership (REEEP), March 2006. This report is based on a workshop held in Kiev in February 2006.

Agriculture. Agriculture employs 25 percent of the work force and is responsible for 6.0 percent of GHG emissions. In 2004, the agricultural sector saw a 19.4 percent output growth which is responsible for about 12 percent of Ukraine's GDP.²² Land use policy revisions have increased the number of private farms from 35,000 in 1999 to 43,000 in 2003; average size increased from 29 to 66 hectares; large farm enterprises became more efficient, increasing their profitability and ability to respond to changes in agricultural markets.²³

Table H11. 2003 emissions from agriculture

Activity	GHG emissions (Mt CO ₂ e)	GHG emissions as % of total	
		Ukraine	EU-15
Enteric fermentation. Cattle	11.3	2.25	5.3
Direct and indirect soil emissions	11.3	2.24	2.5
Fugitive emissions. Agriculture/Forestry/Fisheries	6.7	1.3	1.5
Total	32.1	6.1	9.8

Despite its growth, the agricultural sector remains fragmented and capital-constrained and typical lead times for production and investments are longer than in other sectors. Political risks and inefficiencies in banking and property rights increase interest rates in a sector that requires low interest rates to develop. The sector has suffered ad hoc policy reversals such as the reintroduction of grain price controls in 2003, and since legal frameworks and institutions prevent use of land or assets for collateral, the sector suffers a lack of long-term investments.²⁴

GIS revenues can potentially be targeted to stimulate sustainable agricultural development projects such as organic farming to reduce use of fertilizers and tillage, improved manure management to reduce methane emissions, and more efficient agricultural equipment to create awareness potential reduction of GHG emissions.

The GIS revenues can also target new businesses such as biomass and bio-fuel systems or innovations in the food processing industry.

Table H12. Investment and greening options in agriculture

Investment opportunities	Main barriers	Greening options
Public information campaign on JI and GIS opportunities; financial services to farmers	Agricultural sector comprises many small farmers making it difficult to reach them all	Develop micro and macro loans; develop technical assistance on sustainable farming/carbon-finance Launch public information campaign on opportunities of Kyoto Protocol Stimulate investments in biomass or bio-fuel industries
Stimulate organic farming	Farmers lack knowledge and expertise to change farming practices	
Stimulate bioenergy development	Small-scale companies lack capital to invest in biomass-fired boilers	
Stimulate biofuel development	Biofuel development requires large installations, complex logistics, and reliable biomass supply	

²² World Bank, Ukraine at a Glance 9 December 2005.

²³ World Bank, OECD, Achieving Ukraine's Agricultural Potential, June 2004.

²⁴ Von Cramon-Taubadel, Policies and agricultural development in Ukraine, 2001, Aachen.

Waste management. The waste sector in Ukraine is responsible for 3.0 percent of the country's GHG emissions, mainly methane emissions from solid waste disposal sites. In 2004, the Ukrainian government approved the Program of Solid Household Waste Management in Ukraine to reduce generation and damage caused by solid waste.²⁵

Table H13. 2003 emissions from waste management.

<i>Activity</i>	<i>GHG emissions (Mt CO_{2e})</i>	<i>GHG emissions % of total</i>	
		Ukraine	EU-15
Unmanaged solid waste disposal sites	7.7	1.5	0.2
Managed solid waste disposal sites	7.6	1.5	1.6
Waste incineration			0.1
Wastewater treatment			0.1
Total	15.3	3.0	2.0

Municipal waste is only 2.0 percent of total GHG emissions—about 10 million tons per year—but about 90 percent of Ukraine's 700 landfill sites and both of its waste incineration plants do not meet basic environmental standards. Waste is not separated when it is collected and needs to be sorted for recycling at the landfill site but only a few sites do this.

Table H14. Investment and greening options in waste management.

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Stimulate recycling	Projects' effect on GHG emissions may be difficult to measure and some may have not affect GHG	Provide soft financing or grants for high capital investment projects, provide risk capital for investments, finance feasibility studies, research or pilot projects
Reduce use of packaging materials.		
Public information campaign on how to reduce waste		
Improve waste management and increase capacity to handle hazardous waste.		

Transport. Ukraine is strategically located for transport between Europe and Asia. However, the direct emissions from transport are low compared to that of, for instance, the EU-15. However, emissions from road transport are an important source of pollution in urban areas. The Ministry of Transport estimated that the emissions from road transport can be reduced by about 50 percent.

Table H15. 2003 emissions from transport.

<i>Activity</i>	<i>GHG emissions (Mt CO_{2e})</i>	<i>GHG emissions as % of total</i>	
		Ukraine	EU-15
Transport	10.0	1.9	21.6

²⁵ Ukraine National Municipal Solid Waste Management Strategy -Strategy and Action Plan-, Danish Cooperation for Environment in Eastern Europe (DANCEE) Ministry of Environment, Denmark Ukrainian State Committee for Housing and Municipal Services, December 2004

Modes of transport in Ukraine have been assessed for their contribution to emissions, their recent development, and their carbon intensity; available data are limited but a few conclusions can be drawn from them.

- Buses are relatively carbon intensive and have a large and increasing share in urban passenger transport.
- Air passenger transport’s impressive growth during 2000-05 justifies specific attention to this growing source of carbon-intensive emissions, although air travel share remains small.
- Use of cars and trucks is more carbon intensive and increasing faster than rail for freight transport.

GIS revenues could contribute to reduce transport emissions in several ways:

- Promote use of renewable fuels like bio-fuels²⁶ or energy-efficient public transport, possibly in cooperation with stakeholders from agriculture or forestry sectors. Ukraine hosts some biofuel projects but building biofuel supply systems requires large initial capital investments. GIS revenues could support price guarantees on biofuels or provide financial assistance to investors in early project development.
- Discontinue modal shift from rail and water to road and air transport; for example, introduce high-speed trains as alternative to short-distance flights.
- Stimulate fuel switch from oil-based fuels to natural gas-based fuels, for example, in busses.
- Promote energy efficient motors in electricity- and fossil fuel-based transport.
- Promote consumer behaviour change—more passengers per vehicle; walking and cycling; and economical vehicle operation.²⁷

Table H16. Investment and greening options in transport.

<i>Investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Stimulate lower carbon intensity fuel use	Project effect on GHG emissions may be difficult to quantify if AAU buyers require doing so.	Develop education and public awareness campaigns. Stimulate investments in fuel switch to carbon extensive fuel types. Develop soft financing or grants for projects facing high capital investments, providing risk capital for investments, finance feasibility studies, research or pilot projects.
Avoid modal shift to more carbon intensive means of transport or stimulate transition to carbon extensive transport		
Change consumer behaviour		
Promote energy efficiency in vehicle motors		

²⁶ During 2003-05, gasoline retail prices increased sharply, which could provide an incentive to develop alternative fuel sources leading to emission reductions. Developing carbon extensive fuel sources like natural gas and biofuels could provide an interesting greening opportunity. The number of vehicles fuelled with Compressed Natural Gas (CNG) world-wide has increased from 2.2 million to 3.6 million during 2000-04. In Ukraine to date there are 55,000 CNG-fired vehicles and 161 compressor filling stations.

²⁷ Umwelt Bundes Amt (2003), Reducing CO₂ emissions in the transport sector, Berlin,

Forestry Production . About 16 percent of the Ukrainian land area or 9.49 million ha. is covered by forest, mainly in the Carpathian region. The annual harvest is 12.4 million m³, well below annual forest production of 50 to 55 million m³, indicating that harvesting and processing could increase without increasing forest area.

Table H17. Sources and sinks from Land Use, Land-Use Change and Forestry.

<i>Category</i>	<i>2004 emissions and/or sinks</i>	<i>1990 emissions and/or sinks</i>
Forest land	-55,601.	-55,397
Cropland	38,471	28,948
Grassland	-13,800	-9,046
Wetlands	432	1,391
Settlements	-1,639	238
Other land		
Other		

Over 99 percent of the Ukrainian forests are state-owned and managed. About 69 percent is under the responsibility of the State Forestry Committee (“SFC”), which is responsible to the Ministry of Environmental Protection, and 18 percent of the forests are under the Ministry of Agrarian Policy. The SFC employs about 90,000 people over 26 regional offices, and the forest sector in total provides direct employment to about 350,000 people.²⁸

Box H6. Chernobyl reforestation project

The World Bank Chernobyl reforestation project aims to reforest about 4,350 ha of abandoned agricultural land near the site of the Chernobyl nuclear power plant accident that contaminated this land: no crops for human consumption can be grown until 2020. In total, the project will have sequestered about 0.003 Mt CO₂e by 2012 and around 0.04 Mt by 2017. The State Forestry Committee (SFC) developed and financed the project. Other sources of financing are the Japanese PHRD grant and carbon finance with use of JI.

Source: World Bank Carbon Finance Unit, Ukraine: Chernobyl Reforestation, Carbon finance website: www.carbonfinance.org, July 2006.

In 2002, the Cabinet of Ministers approved the State Programme “On State Programme Forests of Ukraine 2002-2015”. The Program from the State Forestry Committee aims at increasing the area covered by forests by 500,000 ha until 2015. As a result, the expected annual harvest may increase with 2.4 million m³. The state budget would contribute US\$45 million over a 14-year period to achieve the goals under this program.

Investment is needed to improve cost-effectiveness of forest management and private sector development should be stimulated, especially in the wood processing industry. Key criteria to successful development of the Ukrainian forestry sector

²⁸ World Bank (March 2006), Ukraine Forestry Sector Note -Status and Opportunities for Development.

include the following targets, some of which are included in the State Programme Forests of Ukraine.

- Establish objectives for managing forest resources and differentiating among production, tourism, soil erosion prevention, biodiversity preservation, etc.
- Define responsibilities to avoid work programme overlap among institutions and functionaries.
- Improve budget system accountability and transparency
- Formulate clear benchmarks to monitor results
- Expand the forest road network
- Prevent illegal harvesting.

Table H18. Investment and greening options in forestry.

<i>GIS investment opportunities</i>	<i>Main barriers</i>	<i>Greening options</i>
Expand forest area	Limited credibility and transparency of forest sector. Effect on GHG emissions may be difficult to measure	Enhance the feasibility of forestry projects by enabling early and late crediting. Invest in public awareness campaigns to prevent forest fires. Reduce illegal logging, improve forest management and biodiversity. Stimulate investments but refrain from long-term structural subsidies funded by GIS.
Prevent illegal logging		
Improve forest management and capacity building		
Invest in biodiversity		
Reduce forest fires		

Annex I. Summaries of Roundtable Discussions

ROUNDTABLE WITH REPRESENTATIVES OF THE NGO COMMUNITY IN UKRAINE

On 8 June 2006, Vertis Environmental Finance in cooperation with the Ukrainian Cleaner Technologies Centre hosted a roundtable with Ukrainian NGOs to identify perspectives on AAU trade and greening options. The roundtable was subject to Chatham House rules¹.

The roundtable was attended by representatives from the National Ecological Centre of Ukraine (Kiev), Ecoclub (Rivne), Zeljonoe Dosje (Kiev), GreenKit (Vinnitza), Bureau of Environmental Investigation (L'viv), Ecolife (Khmelnitskij), Cleaner Technologies Centre, Climate Change Centre and Arena-Eco.

All representatives agreed with the concept of selling AAUs and using proceeds for environmentally friendly investments; they stressed the importance of civil society participation in project selection, monitoring use of proceeds, and verifying project implementation. They expressed concern about transparency of government decisions and discontent over lack of provision for public comments in the JI approval procedure.

Participants proposed the following criteria for project selection:

- Target projects that are not commercially viable, even with JI, and therefore need financial support from GIS proceeds
- Favour projects with large and cost-effective environmental benefits
- Favour pilot projects with demonstrable broader societal benefits
- Use a GIS framework to implement projects that lack sufficient incentives to be implemented under the existing regulatory framework
- Explore potential for developing approaches to monitor the effect of projects with long-term rather than short-term benefits for Ukraine (for example, projects that aim to change consumer behavior). Some proposals were made to monitor project implementation at a macro level: changes in specific energy intensity of GDP or changes in national energy balances

NGOs expressed reluctance to support projects with general ecological benefits rather than projects that reduce GHG emissions.

To ensure effective distribution of financial resources, participants proposed that concrete projects be financed, that funds be distributed to sectors and municipalities, and that private entities manage GIS proceeds.

¹ "When a meeting or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed".

ROUNDTABLE WITH REPRESENTATIVES OF THE HEAT AND POWER SECTOR

On 9 June 2006 Vertis Environmental Finance in cooperation with the Ukrainian Center for Ecological Consulting and Audit organized a roundtable discussion among representatives of the heat and power sector to identify barriers to investments in GHG emission reductions, and to discuss ideas from the sector on how to allocate AAU revenues.

Energy experts attending the roundtable included a heating sector expert, a former director of the Burshtin power plant, a parliamentary environment committee advisor, a former member of the parliamentary committee on Fuel and Energy, and representatives from the Ministry of Fuel and the privatized LyganskEnergo. The roundtable was subject to Chatham House rules.

Participants identified barriers to developing energy efficiency projects in the heat and power sector.

- Inadequate regulatory base—Municipal heating companies have limited ability to reinvest savings from energy efficiency measures; the green tariff law has yet to be approved, and penalties for exceeding emission levels are too low to provide disincentives.
- Monopolistic structures continue to dominate and reform is slow. There is a concern that energy prices increase, a prerequisite for commercializing heat services, will increase non-payment for services and this has contributed to slow progress in implementing reform measures.
- Misuse of public money
- Financing is scarce—bank loans are not suited to environmental projects.

Participants identified ideas for investing AAU revenues:

- Stimulate heat sector decentralisation
- Use methane from landfills and waste heat from waste incinerators
- Refurbish coal-fired power plants
- Support Greenfield gas-fired power plants with a combined cycle,
- Invest in insulation and monitoring equipment
- Support forest restoration
- Develop urban green zones

Participants also suggested the following:

- Train energy specialists on energy-saving measures
- Improve legal framework for energy-saving incentives
- Train local authorities on tariff policy
- Develop public information programs on rational energy use for radio and television