Climate Strategies

A RUSSIAN GREEN INVESTMENT SCHEME

Securing environmental benefits from international emissions trading

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Taishi Sugiyama, Christian Egenhofer, John Drexhage,
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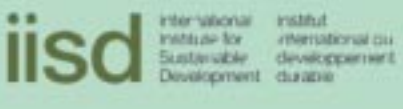

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Climate Strategies is a network of climate researchers engaged in national and international policy processes. Its mission is to integrate the work of the European research community with governmental policy-makers, business executives, NGOs and other stakeholders in order to better mobilize existing results, facilitate their common understanding, including points of contention and controversies, and at the same time increase the policy relevance of research.

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Glossary

Abbreviations and terminology

AAU — Assigned Amount Units, the basic emission allowance for the industrialised countries as listed in **Annex B** of the **Kyoto Protocol**. An **AAU** corresponds to one metric tonne of **CO_2e** which can be emitted any time during the first commitment period (2008–12), or banked for subsequent use.

Accession countries — **CEEC**s expected to become members of the **EU**.

Additionality — The requirement that a project results in additional emission savings, compared to those that would have occurred in the absence of the project, if it is to qualify as a **JI** or **CDM** project under the **Kyoto Protocol**. The additional emission savings form the basis for issuing emission credits.

AIJ — Activities Implemented Jointly, pilot phase of **JI** and the **CDM**.

Annex I — Annex to the **UN FCCC**, listing industrialised country and economy in transition parties to the UN FCCC that assume specific commitments. Almost synonymous to the countries in Annex B of the Kyoto Protocol, which defines emission allowances of Annex I countries for Kyoto's first commitment period.

Article 6 — Article of the Kyoto Protocol defining Joint Implementation.

Article 17 — Article of the Kyoto Protocol defining Emissions Trading.

Banking — Saving emission allowances for use in subsequent commitment periods.

Base year — **AAU**s are defined relative to **GHG** emissions in the base year (1990) for industrialised countries; **EIT**s have some flexibility and some EITs subsequently declared different base years.

Baseline — Projection of emissions that would occur in the absence of an abatement project. Used to calculate emission reductions generated by **JI** and **CDM** projects.

BAU — Business As Usual, a scenario of the future without measures to change the current development. In the Kyoto context often refers to the projected **GHG** emissions of entire countries.

Capacity building — Aid by industrialised countries to developing country and **EIT** parties for supporting their participation in the implementation of the **UN FCCC** and the **Kyoto Protocol** and adapting to the impacts of global warming.

CDM	The Clean Development Mechanism, defined by Article 12 of the Kyoto Protocol. Refers to the emission reduction activities implemented in **Non-Annex I**, mainly developing, countries that create **CER**s, which can then be used by **Annex B** countries to fulfil their commitments.
CEEC	Central and Eastern European Countries – former socialistic economies countries in Europe.
CER	Certified Emission Reduction, a unit issued pursuant to Article 12 of the Kyoto Protocol (the **CDM**).
CIS	Commonwealth of the Independent States: a broad cooperative framework comprising most of the countries which were formerly part of the Soviet Union, excluding the Baltic states.
Commitment period	Timeframe established by the **Kyoto Protocol** for achieving set emission reduction or limitation targets. The first commitment period under the Kyoto Protocol is 2008–2012.
Commitment period reserve	Defined by the **Marrakesh Accords** (FCCC/CP/2001/13/Add.2) decision, Annex of Decision CMP.1. Requirement that a party has to maintain a reserve of **AAU**s in its national registry in order to be eligible to transfer allowances and credits.
COP	Conference of Parties of the **UN FCCC**.
Early crediting	The idea of crediting emission reduction projects other than under the **CDM** prior to year 2008 by using contracts to transfer **AAU**s to honour the emission reductions generated by an early investment.
Early JI	See Early crediting.
EEA	The European Economic Area – countries formally participating in the European Single Market without being full members of the **EU** (comprising Norway, Iceland and Liechtenstein after the 1995 EU enlargement incorporated other EEA members).
EITs	Economies in Transition, refers to both **CEEC**s and Former Soviet Union countries.
ERU	**Emission Reduction Units**, a unit issued pursuant to Article 6 of the Kyoto Protocol (Joint Implementation).
IET	International Emissions Trading, as allowed under Article 17 of the Kyoto Protocol.
EU	The **European Union** comprising fifteen member states (also denoted as EU15).
EU-bubble	Internal agreement between the **EU** countries to redistribute the common Union level emission reduction target between member states. Allowed under Article 4 of the **Kyoto Protocol**.
EU–Russian Energy Dialogue	Framework for cooperation on issues related to energy between the **EU** and the Russian Federation officially launched at the EU–Russia Summit in October 2001.
FDI	Foreign Direct Investment.
Flexible mechanisms	The Kyoto mechanisms: **JI**, the **CDM** and **IET**.
GDP	Gross Domestic Product.

GHG		Greenhouse gas. The principal anthropogenic greenhouse gases as defined in Annex A of the Kyoto Protocol comprise:
	CO_2	carbon dioxide, which accounts for *c*.80% of **GHG** emissions from industrialised countries
	CH_4	methane
	N_2O	nitrous oxide, greenhouse gas included into the basket of six gases recognised by the Annex A of the **Kyoto Protocol**.
	HFCs	hydrofluorocarbons
	PFCs	perfluorocarbons
	SF_6	sulphur hexafluoride
GIS		Green Investment Scheme, the idea of recycling revenues from emissions trading to further GHG emission reductions or other environmental purposes in **EIT**s.
Hot air		In the international literature, surplus AAUs are often referred to as 'hot air'. This term is offensive to many in Russia and is not used in this report.
JI		Joint Implementation, defined by the Article 6 of the Kyoto Protocol. Refers to the emission reduction activities implemented jointly between industrialised countries and **EIT**s.
Marrakesh Accords		Detailed rules for implementing the **Kyoto Protocol** agreed at COP-7 in Marrakesh in November 2001.
MoU		Memorandum of Understanding, a bilateral framework agreement on climate change related cooperation.
$MtCO_2$		Million tonnes of carbon dioxide.
$MtCO_2e$		Million tonnes of carbon dioxide equivalent (basket of greenhouse gases with radioactive impact equivalent to one **$MtCO_2$**).
Mtoe		Million tonnes of oil equivalent.
Non-Annex I		Parties to the **UN FCCC** not listed in the **Annex I** of the **Kyoto Protocol**, mostly developing countries but also several countries of the former Soviet Union. Non-Annex I countries have no quantified emission reduction or limitation commitments so far.
ODA		Official Development Assistance.
PHARE		Assistance programme financed by the **EU** for the accession countries.
RMU		Removal Unit, defined by the **Marrakesh Accords** (FCCC/CP/2001/13/Add.2) in Annex of Decision CMP.1. Represents sink credits created by Annex I countries and can only be used during the commitment period in which they have been generated.
Sink		Ecosystem absorbing CO_2, such as young forests.
TACIS		Assistance programme financed by the **EU** for **EIT**s of Eastern Europe and Central Asia excluding the EU accession countries.
TPES		Total Primary Energy Supply.
Track two JI		A procedure for approving **JI** projects for host countries that do not fulfil the general reporting requirements of the **Marrakesh Accords** (more complex than is otherwise required). It can also voluntarily be used by proponents of projects in host countries fulfilling the requirements.
UN FCCC		United Nations Framework Convention on Climate Change.
VAT		Value Added Tax.

Institutions

BEA	Bureau of Economic Analysis, Moscow.
CEPS	The Centre for European Policy Studies, Brussels.
CPPI	Centre for Preparation and Implementation of International Projects on Technical Assistance, Moscow.
CRIEPI	Centre Research Institute for Electric Power Industry, Tokyo.
EBRD	European Bank for Reconstruction and Development.
ERUPT	The Dutch JI investment programme.
FNI	The Fridtjof Nansen Institute, Oslo.
ICC	Interagency Commission on climate change problems of the Russian Federation.
IEA	International Energy Agency.
IES	Institute of Energy Strategy, Moscow.
IISD	International Institute for Sustainable Development, Winnipeg.
MEDT	The Ministry of Economic Development and Trade of the Russian Federation.
NEDO	The New Energy Development Organisation.
OECD	Organisation for Economic Cooperation and Development.
PCF	Prototype Carbon Fund of the World Bank
RAO UES	Russian Joint Stock Company 'United Energy Systems'.
RIIA	The Royal Institute of International Affairs, London (Chatham House).

About the authors

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Michael Grubb helped to oversee the project in his capacity as Professor of Climate Change and Energy Policy at Imperial College, London, and as a founder member of Climate Strategies. In 2002, he also became half-time Associated Director of Policy at the Carbon Trust, an independent not-for-profit investment company sponsored by the UK government.

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Executive summary

The concept of a Green Investment Scheme (GIS) refers to ways of using revenues generated from trading Assigned Amount Units (AAUs), under Article 17 of the Kyoto Protocol, for environmentally related purposes. A GIS may finance a range of activities, from capacity building in respect of developing appropriate statistical collection and reporting methods to large-scale emission reduction projects.

A GIS can include projects which are quantifiable – for which emission reductions can be estimated – or non-quantifiable. Two approaches can be adopted for GIS projects: a programme approach where a number of smaller projects are bundled together; and a project approach, where each project is treated individually. A programme approach would give priority to small and simple projects for which emission reductions are easy to monitor and verify such as: energy efficiency, fuel switching, renewable energy, and improvement of gas and heat networks. A project approach would favour large (perhaps very large) projects which may be more complex to organise requiring longer time horizons.

The current institutional framework for project investments in Russia has been inadequate even for the Activities Implemented Jointly pilot phase and will need to be changed if GIS projects are to succeed. A single ministry or inter-governmental commission, with support from the highest levels of government, should be put in charge of Russian climate policy and implementation of GIS.

All the major potential buyers of AAUs under a GIS will require the funds to be used for credible environmental purposes and subject to high levels of governance. The views of potential buyers differ on the merits of quantifiable versus non-quantifiable projects and the stringency of requirements such as additionality and verification.

Although the European Union (EU) may not have a substantial demand for Russian AAUs, it is likely to play a significant role in the development of a GIS. There are substantial complementarities of interest between climate and energy policy, on the one hand, and the compatibility of the GIS with European ambitions for the international climate regime, on the other. The EU has a general interest in the architecture of the Kyoto Protocol and will want to be engaged in the development of such an important new policy instrument, particularly one that provides additional interest for Russia to ratify. The EU, and individual member states, are likely to invest through GIS only in quantifiable projects with relatively strict verification and additionality requirements.

Japan is likely to be the largest buyer of Russian AAUs. The Japanese approach is that GIS should include all activities – quantifiable and non-quantifiable – with investors free to decide their degree of 'greenness'. There is a spectrum of opinion which ranges from those requiring strict quantification, including additionality requirements, to those who see no need to incorporate such complexities but value good governance and non-quantifiable activities such as capacity building.

Canada may require significant purchases of Russian AAUs. As far as criteria for GIS investments are concerned, the Canadian position falls somewhere between those of the EU and Japan. Potential Canadian investors are prepared to consider non-quantifiable GIS projects, but with strict verification and monitoring.

A GIS has the potential to bring real environmental benefits and meet profound concerns from several of the key actors in the Kyoto regime. However, establishing a

well-functioning GIS will require the removal of many of the current barriers that have held back investments in the Russian energy sector. Many of these problems have to be resolved by the Russians themselves, but foreign involvement, backed by concrete assistance programmes, can play significant role.

Preface

Throughout the 1990s, Russia was rarely seen as a central player in the international efforts to develop a global response to climate change. The adoption of the Kyoto Protocol gave Russia a much greater stake in the system, and the withdrawal of the United States (US) from the Protocol in March 2001 radically transformed the political landscape of climate change. As this report illustrates, the role of Russia, and the development of effective working relationships between Russia, the European Union (EU), Japan and Canada, are now at the heart of implementing the Kyoto commitments. Discussion surrounding the 'Green Investment Scheme' (GIS) is the most clear and specific illustration of this new reality.

Official Russian interest in the general idea of linking emissions trading to environmentally oriented use of the revenues was introduced at the sixth Conference of Parties (COP-6) of the United Nations Framework Convention on Climate Change (UN FCCC) in November 2000, and the EU officially welcomed the proposal at the resumed COP-6 session in July 2001. During this period, the Climate Strategies network of European research institutions was formed. Together with the Russian Ministry of Energy and CPPI, several Climate Strategies participants decided to launch a collaborative study of a GIS and the practical issues it raises. In this, we were building upon workshops on climate policy set up in Moscow and convened initially by the Royal Institute of International Affairs. The May 2001 workshop was organised by Anna Korppoo, then visiting RIIA, who subsequently became coordinator of this project.

Anna's work, together with the crucial and varied contributions of Oleg Pluzhnikov and Vladimir Berdin in Moscow, and Arild Moe and Kristian Tangen at the Fridtjof Nansen Institute in Norway, have formed the bedrock of this project. Yet, whilst it originated with a Russian-EU focus, it quickly became clear that the GIS discussions needed to embrace all the countries that were likely to be major 'buyers' under the Kyoto agreement. We were delighted that Taishi Sugiyama expressed interest in the project and carried it forward to bring in the crucial Japanese perspective and concerns. Subsequently, the importance of the Canadian dimension became apparent, and John Drexhage was able rapidly to introduce this at the Moscow workshop in April 2002 and integrate it into the final report. Papers presented at the workshop, and a briefing paper prepared for the early stages of the project, can be downloaded from the Climate Strategies website, www.climate-strategies.org.

Thanks are due to all the authors, and to the sponsors of the core project: UK Foreign and Commonwealth Office; the German Ministry for the Environment, Nature Conservation and Nuclear Safety; the Finnish ministries of Environment, of Trade and Industry and of Foreign Affairs; the European Commission Directorate of Transport and Energy; the Swedish Ministry of Industry, Trade and Employment; and the Central Research Institute of Electric Power Industry, Tokyo. The Centre for European Policy Studies hosted a consultative meeting in Brussels. The Russian Ministry of Energy hosted the key Moscow workshop with input from WWF Russia. The workshop debated the issues raised and brought a wider Russian input. We would like to express our gratitude to the Moscow team, especially to Oleg Pluzhnikov of the Ministry of Energy who made organising the event possible, and the funders of the workshop component of this project: the

Dutch Ministry for Economic Affairs; Environment Canada; WWF Russia and Shell International Gas Ltd.

The project was also greatly aided by an international advisory group that represented a mix of sponsoring governments, the private sector and academia. Both the Japanese and Russian members met separately to discuss the issues and develop their perspectives. We are also grateful to Axel Michaelowa, Hamburg Institute for International Economics; Bernard Laponche, Iceconsultants; and Tobias Persson, Chalmers University of Technology at the Gothenburg University for carefully reviewing the final draft text.

The participation of such a diverse group of countries, authors and commentators, inevitably made this a very complex project to manage. Jonathan Stern took principal responsibility for chairing meetings and editing text. That the project has succeeded at all is in large measure due to the skill and dedication of Anna Korppoo, who gained the confidence of all the participants and who has worked strenuously throughout the year to bring this project to fruition. She deserves tremendous thanks and congratulations from all of us engaged in the project, and from the wider community that we hope may benefit from this unprecedented collaboration.

Michael Grubb, July 2002

1 Introduction

Kristian Tangen

Climate change caused by emission of greenhouse gases represents a serious and complex environmental problem. As greenhouse gas emissions are so closely linked to the combustion of fossil fuels – the engine of our current economic structure – they are also inherently difficult to reduce. Hence, the negotiations over international climate change agreements have required major efforts from all parties involved.

In 1992, the UN Framework Convention on Climate Change (UN FCCC) represented an important step in the international diplomacy aiming at combating climate change. However, it was at the 1997 Conference of Parties in Kyoto that the international community agreed upon binding emission targets. With its use of market instruments, the Kyoto Protocol represented a radical new approach for tackling global environmental problems. Although the Marrakesh Accords reached at the seventh Conference of Parties in November 2001 bring us closer to a stage where these new instruments can be implemented, much remains to be decided when it comes to national policies for the use of the new instruments. It will still take years before these are in place, and during this period a number of schemes and instruments will be proposed and debated.

The Russian proposal of a Green Investment Scheme (GIS) stands out in this ongoing debate. The main idea of GIS is to earmark revenues from sales of Assigned Amount Units (AAUs)[1] for projects that would yield environmental benefits, e.g. projects that lead to further emission reductions.[2] In Russia, the development of this idea was originally motivated by an ambition to use the sale of AAUs for financing investments in the Russian energy sector that would lead to higher efficiency. However, many other types of projects are also conceivable under a GIS.

For several reasons, the GIS could make its mark on the global architecture for combating climate change, having the most relevance before and during the first commitment period. Russia is likely to become one of the largest players in a future emissions trading market. Due to the economic contractions since 1990, Russia is likely to have a considerable surplus of AAUs. In addition, the country has a large potential for low-cost emissions reduction projects. As a consequence, Russian participation, and a GIS, could strongly influence the development of the emissions trading market. The volume of investment involved is highly uncertain and will itself depend upon how Russia and other EITs manage their allowance trading,but even after the US withdrawal financial flows to the EITs overall could amount to several billion dollars annually.[3]

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[1] AAUs denote a tradable unit that can be transferred between participants in the emissions trading market under the Kyoto Protocol. Other tradable units are: Certified Emission Reductions (CERs) generated by projects under the Clean Development Mechanism (CDM), Emission Reduction Units (ERUs) from Joint Implementation (JI) projects, and Removal Units (RMUs).

[2] For a discussion of Russia's position in the climate negotiations and its role in a future emissions trading market, see also Moe and Tangen (2000, 2001).

[3] Analysis comparing the results of twelve different models, in which emission transfers from the EITs were managed in ways consistent with trying to maximise their revenue in the aftermath of US withdrawal, suggested financial flows to the EITs overall under Kyoto to be in the range US $2-$6bn annually in these circumstances (see Grubb, Hourcade and Oberthur, 'Keeping Kyoto: a study of approaches to maintaining the Kyoto Protocol', Appendix: available from www.climate-strategies.org). This analysis was carried out before the Bonn-Marrakesh agreements on carbon sinks, which will tend to have reduced international financial flows somewhat.

GIS is an instrument that many buyers of AAUs will find attractive. Unless it encompasses large additional costs, most buyers – countries or companies – will wish to ensure that the money spent on AAUs is not being wasted or misused. A well-functioning GIS will need to ensure that the resulting revenues are used for productive purposes and are well governed. Even though GIS was initially thought of as a government-to-government agreement, companies are also likely to find the mechanism attractive. If it can meet key concerns among sellers and buyers, the Russian GIS proposal might be a model that other economies in transition (EITs)[4] would also embrace.

At the time of writing (June 2002), Russia has still not decided whether it will ratify the Kyoto Protocol; the most recent signals from the Russian government indicate that a decision might not be taken before next year, after an assessment of the economic consequences for the country.[5] If Russia does not ratify the protocol, it will not come into force, but, although ratification is obviously a complex issue, the GIS illustrates that there would be substantial benefits for Russia from the adoption of the Kyoto Protocol.

A GIS is not the only possible approach for Russia to secure real environmental benefits from international emissions trading (IET) in the current circumstances. Another approach would be for the Russian government to implement a domestic cap-and-trade system, namely: to establish an initial cap on the CO_2 emissions of domestic companies, allocate them Kyoto-type emission allowances, and then authorise those companies to trade the allowances internationally. Like the GIS approach, internal allocation of emission allowances would primarily be a matter for internal Russian decision-making, although potential international buyers will probably have views about appropriate criteria (for example, corresponding to some of the GIS criteria discussed in this report) should the resulting allowances be traded internationally. In principle there is no reason why such an approach should not coexist alongside a GIS. However, experience in OECD countries is already showing the complexity of debates about internal allocation of allowances, and similar issues would have to be resolved in Russia. This report focuses upon the GIS approach whilst acknowledging that it is by no means the only approach to international emissions trading in the current circumstances.

The report is organised in the following manner. Chapter 2 provides the general setting for the GIS proposal. The chapter describes how the GIS has emerged in the Russian debate, its relationship to the future emissions trading market and how it links to the interest of Russia and potential buyers of AAUs. Clearly, these issues are central for understanding the reasoning behind the proposal. They also provide the context of Chapter 3, which discusses the design issues that will have to be addressed in the agreements and which will guide GIS projects. The preferences of buyers of AAUs under a GIS may vary considerably with regard to the scope and environmental integrity, and the chapter distinguishes between quantifiable projects (projects for which emission reductions can be estimated) and non-quantifiable projects. It also defines two approaches for a GIS: a programme approach, where a number of projects are bundled together, as opposed to a project approach, where each project is treated individually. The two types of projects, as well as the two types of approaches, pose different requirements when it comes to difficult questions such as additionality and verification. The chapter also discusses how the distributive aspects of a GIS can be approached.

The Russian energy sector is responsible for the major share of Russian greenhouse gas emissions, and the development of this sector will strongly affect the future emissions

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[4] EITs refer to both Central and Eastern European Countries (CEECs) and the Former Soviet Union countries. This report also refers to the Commonwealth of the Independent States (CIS), an organised group of Former Soviet Union countries which includes no CEECs.

[5] 'Putin calls for "pros and cons" of Kyoto Protocol', BBC *Morning Radio*, 6 May 2002.

level. Chapter 4 discusses recent trends in this sector with a view to the type of projects that should be prioritised in the near term. Chapter 5 looks at lessons from the implementation of previous Russian climate projects and what this may imply for the design of a GIS. It examines the shortcomings of the current institutional framework for approving Russian climate projects, e.g. Activities Implemented Jointly (AIJ). The chapter sets out institutional changes and measures which are needed for Russia to attract climate-related investments and revenues, including those for GIS projects. The following three chapters discuss the interests of the countries that could become main buyers of Russian AAUs.

- Chapter 6 discusses how a GIS could fit into the framework for EU–Russian cooperation. The chapter argues that, although the EU might not have a large demand for AAUs, it is likely to play a role in the development of a GIS. The EU's interest in the GIS lies in the complementarities of interest between climate and energy policy, on the one hand, and the compatibility of the GIS with European ambitions for the international climate regime, on the other. The EU has a general interest in the architecture of the Kyoto Protocol and will want to be engaged in the development of any policy instrument, which provides an incentive for Russian ratification.
- Chapter 7 looks at Japanese interests in a GIS. Japanese actors may have a different view of GIS in terms of the details of verification and additionality criteria, and the chapter examines the potential for a 'bottom-up' approach, where Japanese companies voluntarily join GIS arrangements.
- Chapter 8 examines the interests of Canada – another potentially large buyer of AAUs. The chapter looks at the views of the government, industry, and provincial and environmental groups regarding participation in an emissions trading regime with Russia. Concerns about the overall environmental integrity of transactions need to be counterbalanced by the overall credibility of emissions trading and joint implementation.

In the concluding chapter, the authors emphasise that GIS is a worthwhile concept with the potential to bring real environmental benefits and meet profound concerns from several of the key actors in the Kyoto regime. However, establishing a well-functioning GIS means removing many of the current barriers that hold back investments in Russia.

2 GIS – Starting point and main challenges

Vladimir Berdin, Arild Moe, Kristian Tangen, Oleg Pluzhnikov

2.1 Evolution of the GIS proposal

In simple terms a Green Investment Scheme entails connecting revenues from emissions tradings to investments in environmental activities in Russia. The idea grew out of the external opportunities for Russia created by the Kyoto mechanisms, as well as the needs and challenges for Russian economic development and the needs of large emitters, such as the EU, Japan and Canada, to find ways to offset their own emissions and help develop an environmentally benign system for trade in Assigned Amount Units (AAUs: see Glossary for explanation).

The idea has been developed over several years. It was featured in the report 'Kyoto Protocol and Russian Energy' (second edition) published by the Institute of Energy Strategy of the RF Ministry of Energy in 1999, as well as generally discussed in the World Bank study 'National Strategy of the Russian Federation in Greenhouse Gas Emission Reduction' (NSS-1) in 1998–1999, and it has also been discussed in academic literature.[6] An academic assessment of international greenhouse gas emission trading options in the Russian Federation, including aspects of the GIS approach, was carried out between August and December 2001 in a special study by the Bureau of Economic Analysis of the Ministry of Economic Development and Trade of the Russian Federation (MEDT) under activities coordinated and sponsored by the World Bank.[7]

The Russian Government officially recognised the concept of a link between emission sales and emission reducing measures and presented it for the first time at the sixth Conference of Parties (COP-6) in The Hague in November 2000. The Russian Government declared in the national policy statement that it would be 'ready to consider the possibility of targeted use of funds obtained from application of these [flexibility] mechanisms, for further reduction of greenhouse gas (GHG) emissions'.[8] At COP-6-bis in Bonn the GIS concept was confirmed again at the high-level Russian–EU meeting, as well as at the special event 'Kyoto Protocol: View of Russian Parliamentarians'.[9]

2.1.1 Russian views on AAU sales

The proponents of a GIS scheme argue that revenues from emissions trading should be devoted to efficiency improvements that will ensure further environmental and economic benefits. If this income were to be used for general purposes, the environmental situation

[6] A paper by Mastepanov, Pluzhnikov, Berdin and Gavrilov (2000) set out context for and reasoning behind the proposal. Ideas close to GIS were discussed also by Koch and Michaelowa (1999).

[7] Bureau of Economic Analysis (2002).

[8] National policy statement of the Russian Federation at COP- 6.

[9] Organised in Bonn on 21 July 2002 by the Center for Preparation and Implementation of International Projects on Technical Assistance (CPPI) with participation of representatives from MEDT, MinEnergo, Federal Council of the Russian Federation, State Duma and Energy Carbon Fond of RAO 'Unified Energy System of Russia' (RAO UESR).

would continue to deteriorate. Investments in energy efficiency are seen as a prerequisite for improvements in the Russian economy. They will also be necessary to meet targets in future commitment periods, when the position of Russia may be quite different from the easy targets of the first commitment period.

Notwithstanding the official support mentioned above, the idea of a GIS has been controversial in Russia. It has been argued that measures which could be seen as limiting trading in AAUs are not in Russia's interest, and that unlimited trading would maximise Russian revenues. However, much of this argument was based on the assumption that the biggest buyer of Russian surplus allowances would be the US. The decision by the US Bush Administration in March 2001 to reject and withdraw from the Kyoto regime, therefore, changed the market outlook considerably. Without US participation in the emissions trading market, demand for Russian AAUs will be substantially smaller, yielding substantially less revenues.

As a result, Russia's near-term potential for AAU sales has fallen significantly. This means that the basis for discussing Russia's options has changed radically. There is a stronger focus on measures that can help start emissions trading and give Russia access to prospective AAU markets. A GIS is not about restraining sales of AAUs. What separates a GIS from ordinary emissions trading is *a restraint on the use of revenues*. By reserving the revenues for purposes that lead to further emission cuts, a GIS can give Russia long-term environmental and economic benefits.

An important component in the GIS idea was to tackle the controversial issue of 'surplus AAUs' i.e. AAUs which arise not from deliberate measures to reduce GHG emissions but from industrial restructuring and recession.[10] This requires a resolution of Russian requirements to obtain benefits from trading, while at the same time providing an environmentally credible approach for emissions trading. In comparison to unrestricted sales of AAUs, a GIS increases the legitimacy of emissions trading with Russia among key foreign partners. If this expands the market for Russian AAUs it will produce increased revenues.

The logic of these arguments has gradually been gaining ground in Russia. By early 2002 there was a widespread understanding that the demand for allowances and credits is less than the full Russian potential to sell. At the same time it is becoming evident that the European Union, Japan and possibly Canada will play the key role in establishing an emissions trading regime under the Kyoto Protocol.

Under these conditions Russian policy makers began to consider a GIS as a means of providing access to the international emissions trading markets. There is an expectation in Russia that this could yield substantial revenues for investment in Russian efficiency measures. Conversely, there is a growing realisation that if unrestricted quantities of AAUs are dumped into a future International Emissions Trading market, prices, and therefore revenues, could approach zero.

2.2 Russia and the market for emission allowances and credits

2.2.1 Demand and supply

Projections of the future balance between supply and demand in international emissions trading help to indicate the expected potential for GIS, and influence the current decisions of policy makers which may have an impact on the development of a GIS. This section sketches the main characteristics of expected demand and supply of allowances and credits.

[10] In the international literature, surplus AAUs are often called 'hot air'. This term is offensive to many in Russia and is not used in this report.

Clearly, the perceptions of the Russian government are very important. The Institute of Energy Strategy (IES) of the Russian Federation projects that CO_2 energy related emissions in Annex I countries will continue to increase. These figures are perhaps the nearest one comes to an official Russian view on the emerging market of allowances and credits, and are therefore also interesting since they serve as background for much of the discussion in Russia.

According to their estimates, Japan emerges as the largest potential market for emission allowances with 'business-as-usual' projections exceeding its Kyoto allowance by some 900–1,000 $MtCO_2$ during the first commitment period. Canada is the second largest, with a gap of 500–600 $MtCO_2$. The figure for the present EU member states is estimated at 450–500 $MtCO_2e$, somewhat less than Canada. To set this in context, US emissions – by far the largest in absolute terms and in projected continued growth – would exceed their Kyoto commitment by some 6,000–6,500 $MtCO_2e$.

All such individual estimates can be questioned, but the overall picture is clear: the market has become much smaller since the departure of the US from the Kyoto process, and Japan and Canada must be reckoned with as very important potential buyers of allowances and credits. The EU is also a large potential buyer, but estimates of demand for *Russian* AAUs in Europe must take into account the expansion of the EU and the potential of the EU accession countries to meet demand among the existing member states, as discussed in Chapter 6.

The potential supply of Russian AAUs is contested, perhaps more so within Russia than internationally. Generally, official Russian estimates give much lower figures for the Russian surplus AAUs than foreign evaluations. In Russia's second national communication, the country's emissions in 2010 are only 8 per cent under the target in the most optimistic scenario (corresponding to approximately 1,250 $MtCO_2$ of excess allowances and credits over the whole commitment period), and 4 per cent *above* target in the pessimistic scenario.[11] Behind these estimates of the Russian emission projections there is an intense debate about the link between economic growth and CO_2 emissions. The dominant view has been that economic growth is contingent upon growth in emissions.[12] Predicting reduced emissions has therefore been tantamount to saying that Russia will not experience economic growth. However, this view is now being increasingly contested. A recent report from the Bureau of Economic Analysis under the Ministry for Economic Development and Trade predicts a turnaround in the CO_2 intensity of Russia's GDP, and concludes that the country is likely to have 1,500–2,000 $MtCO_2$ available for sale during the first commitment period.[13] In an April 2002 report presented by Roshydromet as a basis for the Russian Government's discussion of climate policies, 3,000 $MtCO_2e$ are given as a median estimate for the whole commitment period.[14] Many foreign analysts believe that even these estimates are too moderate and that the amount of the Russian surplus allowances and credits for the first commitment period is likely to be much higher.

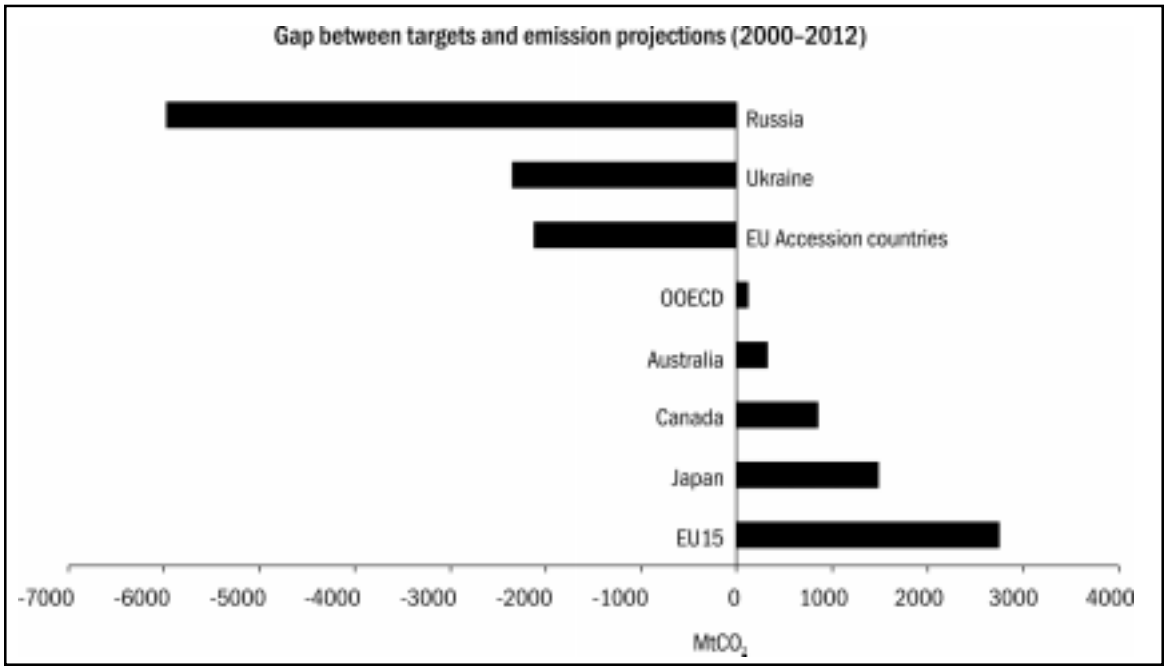
[11] For elaboration, see Moe and Tangen (2000: 35–37).

[12] Ibid. pp. 28–31.

[13] Bureau of Economic Analysis (2002: 162).

[14] The report gives the Ministry for Economic Development and Trade as the source for the figure.

Figure 2.1 Gap between Kyoto targets and reference emission projections (2008–2012)



Units: Gap between reference emission projection and Kyoto commitment, total aggregated over five-year period 2008–12, in $MtCO_2$.
Source: PointCarbon

Figure 2.1 depicts the balance in the market among Annex I countries after the EU projected enlargement, based on various non-Russian estimates of future emissions.[15] It illustrates that the deficit among the existing EU member states may be almost covered by the surplus allowances among the accession countries, leaving a rather limited additional demand for imports of allowances and credits. In this figure, the forecast of Russian AAU surplus is approximately 6,000 $MtCO_2e$ for the first commitment period – much higher than the Russian projections, but still not the highest. Even though the uncertainty regarding supply as well as demand should be underlined, the point of this report is not to arrive at new consensus estimates, but to demonstrate that the GIS concept is relevant for the whole range of mainstream projections.

2.2.2 Russia in the international emissions trading market

From Figure 2.1 and even from the more moderate Russian forecasts, it is clear that Russia has the potential to be a dominant seller of AAUs. But Russia's potential dominance should not be exaggerated. The Ukraine is another very big potential seller, even if it is uncertain when it could become eligible for emissions trading. The EU accession countries in central Europe are also likely to be potential sellers of excess AAUs. It is also very important to remember that emissions trading cannot be seen in isolation. Both AAUs and ERUs from other Annex I countries, as well as CDM projects in developing countries, can provide credits that will compete with Russian AAUs.

[15]The estimated 'gaps' are based on a review of historical emissions trends, national communications and modelstudies. The rational behind the relatively low emissions scenarios for the Economies in Transition is similar to the scenarios developed in Moe and Tangen (2000:40-2).

In the global emissions trading market Russia will have the potential to push the price down – not only because of the large volumes it can supply – but because these volumes are excess AAUs at the disposal of the Russian government without any additional cost.[16] Russia has the potential to undercut prices derived from CDM projects, since the latter will have to reflect abatement costs in some way.

The view that unrestricted sales of Russian AAUs will *automatically* drive down the price may be contested. It may be that the market price is determined by expectations in relation to the development of the CDM and demand for AAUs in the *second* commitment period, rather than by the market balance in the *first* commitment period. Under such circumstances, the price may not collapse, even if Russia sells all its AAUs, since other parties will bank the amounts they buy that exceed what they need to offset emissions in the first commitment period.

In any case, it is unclear why Russia should *want* to undermine the price. On the contrary, Russia should be interested in high prices. But although high prices for AAUs are attractive, it is important for Russia to find a balance between the price and the competitiveness of AAUs in comparison with the other Kyoto mechanisms. This not only applies to short-term market operations – the volume of AAUs offered for sale in any given period – but also to the overall Russian position with regard to AAU sales. If Russia is seen as embarking on a policy intended to manipulate the price, major potential buyers, such as the EU countries, Japan and Canada, are likely to put increased emphasis on developing alternative options (especially CDM projects) to the detriment of Russia.

A major challenge in establishing a GIS will be to create investment opportunities in cost-effective emissions reduction projects or other activities that are deemed both appropriate and credible, so that international markets can have confidence in a stable and acceptable supply of AAUs from Russia.

If revenues from the sale of AAUs are channelled into projects that lead to further emission cuts, the potential 'over-supply' of Russian AAUs will continue. But this should not be regarded as a problem. The volume of AAUs that Russia will bank in the second commitment period will increase in step with the volume of credits generated through GIS projects.

2.2.3 GIS as a tool to increase credibility of the IET market?[17]

Emissions trading is not an objective in itself but rather a tool for achieving environmental objectives at least cost. However, a precondition for achieving this objective is that the market can function efficiently. The question is also whether the GIS could be a tool to lend credibility to the emerging emissions market.[18]

To function efficiently, the market requires a *commodity with inherent value*. Whilst the Kyoto Protocol defines national emission allowances for a given period, this can only result in a privately tradable commodity if the national commitments are translated into national legislation creating and defining emission allowances as such, giving them the character of tradable property rights.[19] To preserve the value of the commodity (i.e. the

[16] This does not mean that the surplus quotas have been *obtained* at no cost in a broader sense. The Russian argument that the country has paid a high price in terms of economic recession should be taken into account here.

[17] This section is based on input from CEPS.

[18] For a more detailed discussion on market efficiency, see Egenhofer and Legge (2002, forthcoming).

[19] Strictly speaking, emission permits created by domestic legislation are 'quasi' property rights, but effectively they behave like property rights in a market. The political and legal distinctions between allowances and rights are such that negotiators emphasised that 'The Kyoto Protocol has not created or bestowed any right, title or entitlement to emissions of any kind' (FCCC/CP/2001/13/Add.2)

AAU), market participants seek protection from the risk of devaluation. Thus, in order to maintain a reasonable market price for AAUs handled through a GIS, it makes sense, at least for the transition phase until the first commitment period, to create safeguards against an unregulated inflow of Russian AAUs into the OECD countries. First of all, this means that an appropriate legal framework for the handling of AAUs in Russia must be developed.

At the same time, the GIS could also provide *confidence,* which can increase the stability of markets. This is particularly important in a market where the regime is not yet fully developed. A successful market gives predictability for investment and thereby provides the certainty that allows businesses with long-term rates of return to make informed decisions on, for instance, whether to invest in new equipment to reduce emissions, or to buy permits.

Finally, trade in Russian AAUs will only develop smoothly to the extent that market participants (notably intermediaries) have confidence in the commodity and believe in the stability of the framework. If these conditions are fulfilled, both AAUs or ERUs could be used as an additional tool to insure against investment risk in Russia. If not, there could still be trade in Russian AAUs, but at a substantial discount.

2.3 General requirements on the Russian side

2.3.1 The overall investment climate and competition with the CDM

As mentioned above, the price for AAUs will not develop in isolation from credits obtained through the two other flexibility mechanisms. JI projects and projects under the CDM with foreign participation will compete with international emissions trading for investment funds. The competition will not only involve the price of ERUs, CERs (Certified Emission Reductions) or AAUs, other commercial criteria will also play an important role. For example, without commercial benefits to offset the barriers and risks associated with projects in Russia, there are likely to be few projects realised. Thus, for investors comparing the returns from a JI or GIS project in Russia with a CDM project in a developing country, transaction costs and the overall institutional framework may be decisive.

Many Russian experts are concerned about competition from investments in CDM projects in developing countries. They argue that a GIS under procedures and rules elaborated jointly between Russia and potential partners can become more attractive than, or at least competitive with, investments in CDM projects. If a GIS can offer an easier way to valid credits, as well as environmentally sound investments, it will claim a major competitive advantage.

The relative competitive strength of the individual flexibility mechanisms may change over time. In the short term (before the first commitment period) the CDM has an advantage since such projects can be credited in the period before 2008. GIS can be competitive if it also allows crediting before 2008 with lower transaction costs.

2.3.2 Russian eligibility for AAU trading

As long as Russia is not eligible for emissions trading, it cannot sell and transfer AAUs to other countries and thus reap the full potential of GIS.

First, the Kyoto Protocol will have to come into force and will have to be ratified by Russia. In the most optimistic scenario this may happen in 2002 (although at the time of writing in mid-2002, 2003 appears more likely). As discussed below, however, the bigger

hurdle is for Russia to fulfil the reporting and verification requirements under the Protocol. However, even if Russia cannot fulfil the eligibility criteria for emissions trading before 2007, a GIS might begin to operate sooner. To finance early investments of a GIS, AAUs will have to be sold on a forward basis, i.e. contracts where the AAUs will be transferred to the buyer when Russia becomes eligible.

As long as commercial actors feel there is a risk that the transfer of AAUs will not take place due to lack of eligibility, such forward contracts will probably have to be sold at a substantial discount compared to a situation where Russia is eligible for emissions trading. Consequently, if Russia wants to sell AAUs on forward contracts to commercial actors to kick-start a GIS, the country will have to accept that AAUs will be sold at lower prices than will be the case when Russia fulfils the eligibility criteria for emissions trading.[20]

2.3.3 Ratification

The parliament hearings organised in the Russian State of Duma in June 2001 demonstrated general support for ratification.[21] The ratification issue was discussed by the Russian government on 11 April 2002. Mikhail Kasyanov, the Russian prime minister, said at the opening of the discussion that Russia must ratify the Kyoto Protocol and that Russia needs to find ways to attract more investments in environmental projects and reduce energy consumption.[22] It was decided to work out a plan of measures required for ratification and also prepare a draft law on ratification, within three months.[23] Nevertheless, a decision to ratify has not been taken.

2.3.4 Reporting

To become eligible for emissions trading, Russia has to calculate its assigned amount and have this approved in an expert review by the UN FCCC. It must also establish a registry and report its emissions in a manner that is acceptable to international review teams. Relatively poor statistics, and massive shortcomings in the earlier Russian national reporting, indicate that Russia has a lot of ground to cover before it fulfils the international reporting requirements. The statistical system in Russia differs significantly from what is accepted in most other countries that are members of Annex I and OECD[24]. When Russia has submitted its national communication there will be a substantial review process and, potentially, also requests for revisions and additional data. We believe that Russia will make every effort to meet these standards and will be assisted by the investors keen to buy Russian credits and allowances.

One of the reasons for this situation is that improvements in the Russian registration and reporting system were supposed to be financed by the Russian Federal Climate Programme. During the period 1997–2001 this programme received only 3% of its

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[20] In practice, buyers may want to pay only for options to buy in the future if Russia becomes eligible, and even this arrangement may require deposit, for instance, in the form of a commitment to deliver ERUs under track two-JI in the case of non-eligibility to transfer AAUs.

[21] A preliminary analysis, made by CPPI to the Parliament hearings demonstrated the advantages and positive consequences that Russian economy can get from the Kyoto protocol coming into force. 'Strategic Environmental Assessment. Ratification of the Kyoto protocol by the Russian Federation', Summary of parliament hearings, 18 June 2001, CPPI.

[22] 'Russian PM urges Duma to ratify Kyoto Protocol', Interfax, Moscow, 11 April 2002

[23] http://www.government.ru/ 11 April 2002

[24] OECD/IEA (2002), prepared with the assistance of Russian experts, demonstrated these gaps.

funding, and financing was curtailed completely from 2002. A 'Climate component' has been included in the federal programme 'Energy Efficient Economy' which was approved in November 2001. But this will hardly offset the cancellation of the Federal Climate Programme. The share of federal financing in the 'Energy Efficient Economy' programme is less then 1%.

In theory, Russia could become eligible for emissions trading soon after it has presented its national report containing an estimation of its assigned amount, but in practice this could become a protracted process.[25] Technical assistance to speed up the process would seem to be a natural component of any large-scale scheme involving emissions trading with Russia. However, the more important measures which are required will depend on Russia's own priorities and decisions.

2.4 The need to take into account the interests of other key actors

The establishment of a GIS is also linked to the potential interests in the scheme from other key parties in the climate regime, and their interests are worth exploring further. Of course the interests of other actors are not necessarily consistent and finding a design for GIS that accommodates all viewpoints is not necessarily easy.

For some countries the prospects of emissions trading in surplus AAUs from Russia has been a central concern. According to these critics, such trade would undermine the legitimacy of the climate regime and proposals for limiting or eliminating it have been advanced. GIS could alleviate the problem and, at the same time, give participating countries access to the external allowances these countries will need to fulfil their targets under the Kyoto Protocol. At the same time a GIS could contribute to higher energy efficiency in Russia, which is seen as a prerequisite for general economic development in the country, and also as a factor supporting Russia's continued role as an energy exporter.

But in some quarters there is scepticism towards schemes that are interpreted as limitations on emissions trading, or schemes that seem to complicate trading. According to this view, allowing emissions trading without any linkages or constraints is the safest way to create a market for emission allowances that is big enough to meet the demand from countries which are in deficit.

Another concern among potential buyers of Russian AAUs is the economic integrity of the AAU sales. These buyers will demand that the sale of Russian AAUs is conducted in a way that maximises good governance of income derived from trading.

Some expectations and priorities of major purchasers may not totally correspond to the ideas put forward from the Russian side. The specific interests and policies of the EU, Japan and Canada will be discussed in more detail in chapters 6, 7 and 8. Differences in perspective may lead to negotiation of bilateral agreements rather than a single multilateral agreement, but whether GIS is negotiated as bilateral agreements or one multilateral agreement, it will entail a commitment from all parties – not only from Russia.

Conceivably GIS could remain a unilateral Russian proposal. In this case, the Russian government would have much greater flexibility regarding the determination of operational procedures – for example, what kind of projects should be eligible, how stringent emission reductions will have to be defined and what might be an institutional structure

[25] The latest OECD assessment (OECD/IEA Case Study: 'Possible approaches and next steps for the development of national inventory system in the Russian Federation', 2001) describes existing monitoring and reporting problems and milestones required in the development of the national monitoring system according to Article 5.1 of the Kyoto Protocol, before the deadline, 2007.

and legislative/regulatory requirements. However, the risk is that the Russian design will not be acceptable to foreign investors and negotiations will be necessary, similar to bilateral/multilateral agreements, to achieve such acceptability.

2.5 Summing up

A successful GIS will have to address the particular interests and concerns of all the key parties (Russia, EU, Japan and Canada) and have a level of associated transaction costs and risks that makes it competitive with other alternatives for transfer of allowances and credits. It is attractive because it has the potential to:

- Bring real investments in Russian energy efficiency, as well as environmental improvements;
- Become a system for trading in Russian AAUs with high environmental legitimacy;
- Provide better market access for Russian AAUs;
- Give foreign industry direct or indirect access to Russian allowances as a way to offset their own emissions;
- Bring predictability, and thereby credibility, to international emissions trading.

3 Design of a GIS

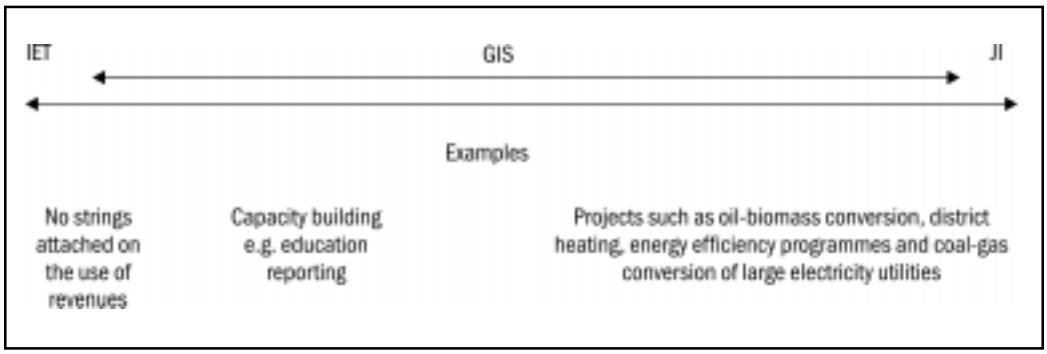
Kristian Tangen, Arild Moe, Vladimir Berdin, Oleg Pluzhnikov

3.1 GIS: the core idea

As described in Chapter 2, the core idea behind a GIS is to use revenues from sales of surplus AAUs for specific purposes. But exactly what purposes need to be discussed. The potential buyers of AAUs under a GIS are likely to have different requirements to how the revenues from sale of AAUs should be spent. Some countries, or companies, will require that money is spent on projects leading directly to additional emission reductions. Other actors will wish to include other activities such as capacity building, education and social programmes.

As an illustration, one could view GIS as a set of options occupying a section of a continuum starting with unrestricted emissions trading at one extreme and strictly defined and monitored JI projects at the other (Figure 3.1). Under the Kyoto Protocol a range of options along this continuum are conceivable and legitimate.

Figure 3.1 Spectrum of possible activities under a GIS



It is important to note that a GIS would not form part of the Kyoto framework, but would be a specific use of the instruments established under the protocol, since the sales of AAUs under a GIS will be governed by the rules for emissions trading under the Kyoto Protocol (Decision J.4 in the Marrakesh Accords).[26] The rules for Joint Implementation (Decision J.2) have no bearing on GIS-projects other than providing a background for project-related schemes.[27] Hence, Russia and the potential investors under a GIS have substantial freedom to determine operational procedures.

[26] The Marrakesh Accords agreed at COP- 7 in Marrakesh, Morocco, November 2001, spell out the rules for the so-called Kyoto Mechanisms: emissions trading, joint implementation and the clean development mechanism.

[27] Some of the schemes that are conceivable under a GIS might actually be credited as track one JI-projects, but when we are talking about JI we normally refer to what is characterised as JI track 2, e.g. projects where verification by an internationally approved third party is required.

3.2 GIS: bilateral and multilateral agreements

A GIS could be governed by a single multilateral agreement involving all the parties, or a series of bilateral agreements between Russia and each individual party. The differences in the requirements of the buyers in terms of the acceptability of different projects (Figure 3.1) and verification may complicate the negotiation of a multilateral agreement between for example Russia, EU, Canada and Japan. From the outset, agreements under a GIS were thought of as being between countries. However, it is also conceivable that similar agreements could be between the Russian state and companies in countries that are not part of GIS, and that are allowed to offset their emissions with Russian AAUs without any restrictions or requirements from their home government regarding the greenness of the AAUs. These companies might still want to see that their investments are used for specific purposes, and hence prefer to buy AAUs under a GIS.

Consequently, the bilateral agreements under a GIS could vary considerably. However, most buyers will prefer that

- Russian revenues from sale of AAUs are earmarked for environmental purposes and used in a way that benefits the Russian society;
- The revenues are well governed, so that funds are not misused or wasted.

Below we will elaborate what this might mean in practical terms.

3.3 Good governance and transparency

Most potential buyers of Russian AAUs would prefer to see that the revenues from sales are governed in a manner that is transparent and assures that funds are not misused. Suspicion about misuse of funds is likely to discredit the scheme and deter new investments. The current approval system for AIJ-projects is not satisfactory in this respect – see, for example, Chapter 5. Semi-official organisations which claim fees for registration of projects, leaving potential investors uncertain whether the money will be used for the intended purposes, is a good example of such problem. If a GIS is to attract investments, procedures following international accounting standards have to be established to ensure transparency and avoid suspicion of illegal activity. In general, as highlighted in FNI and IES (2001), transparent procedures for handling financial flows and for approval of projects could greatly increase investors' willingness to enter climate projects in Russia.

3.4 GIS actors[28]

In theory, two levels of actors, governmental and private sector, could be relevant to GIS. These actors must be both foreign and Russian. The practical roles of these actors depend on the design of GIS (see Figure 3.2 below).

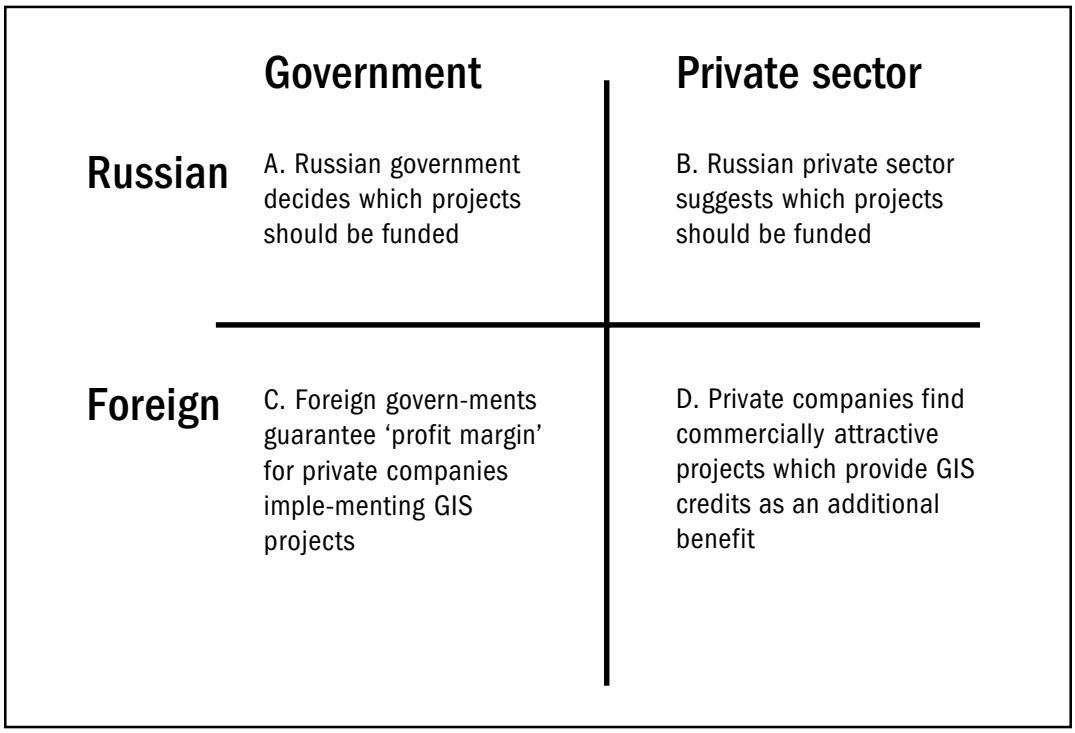
In Figure 3.2, the actors are divided into two pairs: government and private sector and, Russian and foreign. All these groups are potential actors in GIS. However, not all of them need to be simultaneously involved in GIS. All four groups of actors may be involved but at different stages of GIS. Governments are needed for establishing GIS arrangements and they may have a supportive role if private sector actors take the lead in implementing GIS projects (as suggested in option C). The minimum requirement is that the Russian and foreign actors cooperate, whether between governments, private

[28]The following section is based on input by Anna Korppoo and Jonathan Stern.

sectors companies or between government and private sector. Without such cooperation GIS cannot be established, but there are number of ways to decide how projects are chosen and operated. Russian and foreign private sector actors are most likely to cooperate if there are economic benefits expected from the projects, and if the Russian private sector actors need foreign assistance.

The likelihood of commercial profitability of projects increases from A to D. However, projects which are commercially attractive to the private sector (option D) seem less likely to materialise prior to further advances in Russian economic reform. Consequently, the support of governments, Russian and foreign, for private sector actors implementing GIS projects will be necessary in order to protect them against the current difficulties in the Russian investment climate. In practice, the models introduced in Figure 3.2 are likely to be mixed and, given that the main criteria for GIS projects is to generate additional emission reductions, may not be very different from each other. Options A and C would be more likely to lead to non-quantifiable activities such as capacity building rather than the private sector driven options.

Figure 3.2 Potential project selection and funding distribution arrangements for GIS



The main differences between projects selected in options A and D – the Russian government and a foreign private sector actor – are most likely to be in terms of size and economic efficiency. Russian actors have traditionally been keen on large projects while some foreign investors would be likely to focus on small and easy projects in order to avoid long negotiations and large investments in one project. Project efficiency will probably be higher priority for a foreign commercial company than the Russian government.

3.5 Scope of activities

Different types of activities have been envisaged under a GIS. A main distinction can be drawn between activities that lead to emission reductions that, in theory, can be estimated and quantified (e.g. JI-like projects), and activities for which the emission reductions are not quantifiable (e.g. capacity building).[29] Both types of activities have advantages and disadvantages.

One main argument for non-quantifiable projects is that they can reflect a broader spectrum of priorities. For example, it can be argued that current Russian priorities should be to improve standards of statistical and national reporting sufficiently to become eligible to participate in emission trading,[30] and that GIS could help fund such activities. Another argument for non-quantifiable activities is that transaction costs might be lower, and the likelihood for success higher, than for JI-like emission reduction projects. The experiences from Russian AIJ-projects seem to support this argument.[31]

The main argument against non-quantifiable activities is that they complicate the evaluation of environmental integrity. By definition, it is impossible to evaluate the effect of non-quantifiable projects on emissions. The environmental value and significance of such projects is likely to be continually questioned, and consequently they will have less credibility in an environmental context, than projects leading to quantifiable emission reductions.

However, there is a trade-off between environmental quantifiability and investment volumes, and this poses a dilemma. GIS could be defined in a strict manner where all investments are channelled into closely monitored projects leading to quantifiable emission reductions. This will not be in line with the priorities of the largest buyers of AAUs and many of them will probably turn elsewhere and buy AAUs that are not 'green'. Hence, a GIS that includes non-quantifiable activities is likely to attract larger investments than one that does not. Consequently, although a quantifiable GIS ensures that the money goes to emission reductions, it is by no means certain that it will lead to larger long-term environmental benefits than a GIS that includes non-quantifiable activities.

3.6 Non-quantifiable activities

In the international literature,[32] and at the workshops organised in the course of this project,[33] a number of non-quantifiable activities have been proposed that could possibly be financed by a GIS. Most of them fall into one of the following six categories:

- Capacity building related to the implementation of the Kyoto mechanisms. Reporting, training, system design, etc.
- Research and education related to climate change.
- Other environmental measures. For example, measures to reduce local air and water pollution, etc.
- Energy projects that are environmentally sound but do not easily qualify as JI-projects – for example, infrastructure for gas, electricity transmission management.

and also activities with a broader societal scope and less direct environmental relevance:

[29] The terms quantifiable and non-quantifiable activities are taken from Koch and Michaelowa (1999).

[30] See Chapter 2.

[31] See Chapter 5.

[32] For example, Koch and Michaelowa (1999).

[33] Workshops on GIS in Brussels, 21–22 March 2002, and Moscow, 24-27 April 2002.

- Reduction of distributive effects from measures that lead to emission reductions. For example, poverty alleviation to victims of price reforms in the energy sector.
- Social programmes. Assistance related to health, economic development, etc.

These are of course rather broad categories of activities. They could all possibly be financed under a GIS. However, the extent to which activities will be attractive for the foreign buyers of Russian AAUs will very much depend on how projects are practically implemented. For example, there will be a trade-off between transaction costs and the integrity of the scheme. High transaction costs or low integrity might deter investors, but to ensure a high integrity, verification procedures that increase transaction costs might be required.

As noticed above, one of the advantages of including non-quantifiable projects is that transaction costs might be lower. However, the assurance that funds are not misused in relation to social programmes might also involve considerable transaction costs. If the projects are not generally seen as credible and imply a reputation risk for the buyer of AAUs, it might also deter investments. This might, for example, be the case for projects that address wider social concerns and constitute general budget subsidies or specific subsidies for particular industries. Avoiding reputation risks may rule out a number of projects, or add considerable extra costs. Consequently, to the extent that the buyers of AAUs deem non-quantifiable projects attractive such projects will have to be defined and implemented in a way that handle the issues mentioned above.

3.7 Quantifiable projects

For projects leading to quantifiable emission reductions, Russia offers considerable challenges. As illustrated by the experiences in the AIJ-pilot phase,[34] implementation of projects has often been made difficult by high transaction costs and institutional barriers. Strong requirements to ensure environmental integrity could add to this and effectively delay implementation. Hence, although some investors might require high environmental standards if they are going to invest, measures that could bring down transaction costs will also be important to get such projects off the ground.

3.7.1 Programme and project approaches

With regard to projects that lead to quantifiable emission reductions, a GIS can in principle be envisaged operating in two different ways.

1) A scheme with no link between the buyer of Russian AAUs and the actual emission reduction project in Russia to be financed by the sale of AAUs; and
2) A scheme where the buyer is involved in carrying out the project.

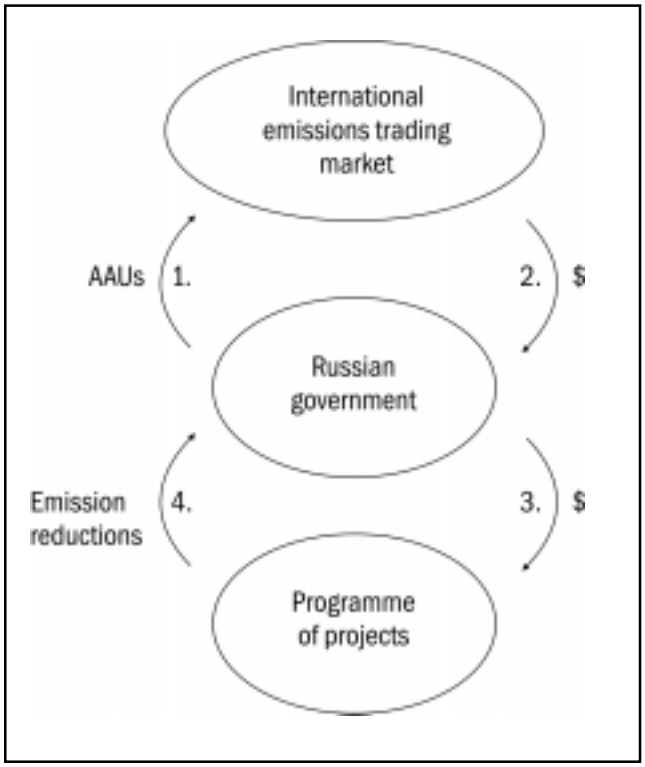
The first alternative may be regarded as an extension of emissions trading: A foreign company purchases Russian AAUs in the international emission trading market to offset his own emissions. The Russian government, who is the holder of the AAUs, uses the income to invest in efficiency or abatement measures that lead to further emission cuts in Russia. Thus the foreign buyer is not involved in project development. (Foreign companies may be involved on an industrial basis in emission reduction projects, but this would not be linked to AAU trade.)

Under this alternative, a GIS could be envisaged as a source of funding for government programmes aimed at energy efficiency and emission abatement measures. Such

[34] See Chapter 5.

programmes could typically be composed of series of smaller projects with identical or similar features. We will call this a *programme approach* (Figure 3.3). Such an approach might build on existing (and under-financed) Russian energy-efficiency programmes.

Figure 3.3. Programme approach to GIS



A programme approach would also permit the income from smaller purchases of AAUs to be collected in a way that provides a serious financial contribution over time. A fund could be established to provide a continuing source of finance for government programmes.

Funding through the programme approach should probably be reserved for improvements in the state sector. Such improvements will not produce direct commercial benefits. This will make it easier both to secure additionality,[35] if required by the buyer of AAUs, and to avoid allegations that programme funds are used to subsidise industries.

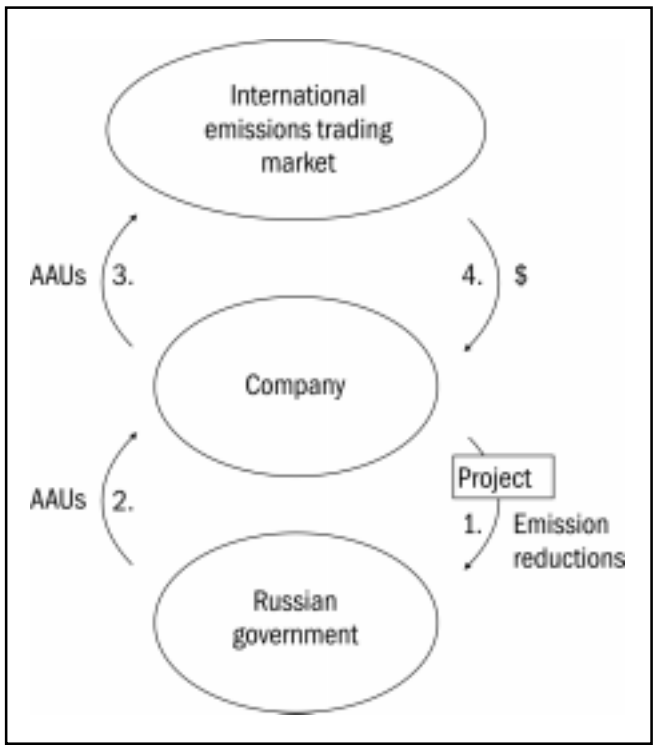
The second alternative has more similarities with Joint Implementation, and this approach is most naturally primarily targeted towards the private sector in Russia. In this case a project is developed in Russia, and the project developers apply for support from the Russian government in the form of AAUs that the developers can sell or use to offset their own emissions. In this alternative the receiver of AAUs is directly involved in project development that will typically be large and unique projects. Hence we will refer to this a *project approach* (Figure 3.4).

These two approaches, the programme and the project approach, do not have to be mutually exclusive. On the contrary, it would be advantageous to have the approaches working in tandem. This means that under a GIS, the government can use the revenues from the sale of surplus AAUs to finance energy-efficiency programmes, but Russian industry can also use the scheme for financing emission reduction projects.

The principal differences between the project and programme approach are illustrated in Figures 3.3 and 3.4 .

[35] See the discussion of additionality below.

Figure 3.4. Project approach to GIS



3.7.2 Additionality: the need for a flexible interpretation

Additionality means that a project leads to emissions reductions which are additional to what would have happened if the project had not been implemented. This means that emission reductions have to be estimated from the hypothetical emissions level that would have been the case in the absence of the project. This hypothetical emissions level is usually described as the project's baseline. The problems encountered in defining additionality with a GIS will be similar to those encountered in Joint Implementation.[36]

In a Russian context it is difficult to evaluate whether a projects leads to emission reductions that would otherwise not have occurred. Many projects that are profitable and should be implemented according to commercial logic are not carried out because of institutional or capital constraints (see also Chapter 4). This calls for a flexible interpretation of additionality and it might be useful to permit the inclusion of whole categories of projects, such as oil-biomass conversions. Such a simplified additionality definition is particularly relevant under a programme approach.

3.7.3 Early crediting

Under the international rules for JI (track two) only emissions reductions taking place between 2008 and 2012 will be credited. Russia, seeking to attract investments at an early stage, will wish to credit emissions reductions that take place before the start of the first commitment period (in 2008). Early crediting under the GIS will improve the attractiveness of GIS compared to the CDM. (Under the CDM, emission reductions from 2000 will be credited). Early crediting will also improve the competitiveness of a

[36]For example, Michaelowa (1998), or the Fridtjof Nansen Institute and the Institute of Energy Strategy (2001).

GIS compared to other offset opportunities that will develop – for example, allowances and credits from other countries, domestic/regional allowances, etc.

3.7.4 Possibilities for simplified verification procedures

The 'technical' problems associated with verification, such as establishment of baselines, have been extensively discussed in the literature on JI.[37] Stringent verification procedures might add substantial transaction costs and hamper project implementation, and, as in the case of additionality, the complex situation in Russia calls for some flexibility when it comes to verification procedures.

Need for verification poses special problems in relation to GIS; actual emission reductions may only be achieved long after the investment funds have been allocated. One solution to this problem would be to dedicate the use of GIS money to projects with certain and substantial environmental benefits, and with strict monitoring of corporate governance.

Specific verification requirements depend on the project characteristics. In some projects, such as fuel switching or refurbishing of boilers, emissions reductions are far easier to prove and verify than in others – for example, conservation measures. It is easier to apply simplified verification procedures under a programme approach where, for example, only a sample of projects are verified. For larger projects, verification costs constitute a smaller share of the project costs, and hence more thorough verification procedures can be justified, such as requiring verification by an international third party recognised under the UN FCCC.

3.7.5 Size of projects

Minimisation of transaction costs is an important concern for JI as well as GIS projects: projects where the share of transaction costs is minimal should be given priority. If projects are treated individually (see the discussion of the project approach above), this will probably imply larger projects. In the programme approach, the idea is to combine similar smaller projects and thereby reduce the transaction cost for each individual project.

3.7.6 Selection mechanisms

To ensure that the best projects are selected, various selection mechanisms may be contemplated. One such mechanism might be a *bidding scheme*. This would mean that project proposals enter a competition for access to GIS funding. In simple terms, the project that promises emission reductions at lowest cost should be selected. Elements of bidding can also be envisaged in the programme approach. Various companies could compete to offer the most efficient solution to a given task, i.e. upgrading of infrastructure.

3.8 Distributive aspects

From an environmental perspective, it makes most sense to compare and select projects on a national basis. However, politically, the distributive aspects of GIS cannot be

[37] Ibid.

disregarded. Access to GIS funding could be organised in a number of ways, including a tender, free distribution of AAUs, or allocation of funds in support of projects. All of these methods must be organised in ways which are seen to be just and reasonable.

One approach would be a *regional distribution* of funds linked to regional policy – for example, as a component of the Russian Energy Strategy. If the amount of potential projects is large, this does not necessarily create a problem. The regional division does not have to involve all 89 federal subjects; it could, for example, encompass the eleven economic regions in the country. In concrete terms, projects could be selected centrally but with geographical distribution as one criterion, or AAUs could be allocated to the regional level where the selection process would take place. In the case of centralised selection of projects, opportunities in far-from-investor regions may more easily be taken into account, such as energy saving projects in Kuzbass, Urals.

Another typically Russian approach would be *sectoral distribution*. The argument here would typically be that various economic sectors should have equal access to the good. Also, in this case, given a sufficient number of potential projects it is possible to envisage a system that could handle distribution in an environmentally acceptable way. However, the arguments for sectoral distribution are weaker than for regional distribution. In the latter case, auxiliary environmental and economic benefits can be distributed equitably among the population. In the former case, the emphasis is equity between economic sectors. Use of climate-related mechanisms, even indirectly, for the purpose of supporting existing economic structures is likely to send inappropriate economic signals.

3.9 Summary: GIS compared to emissions trading and JI

From the outset, a GIS was considered likely to become a mix of emissions trading and JI, and the design outlined here reflects this combination. For several reasons a GIS has advantages compared to JI where there are substantial verification requirements, on the one hand, and IET where there are no restrictions on the use of revenues, on the other:

3.9.1 Possible advantages of GIS versus emissions trading

Additional economic and environmental benefits. Earmarking the use of revenues from sale of AAUs ensures that the funds are channelled into investments that can have large and long-term economic and environmental effects.

Additional possibilities to attract investments from environmentally oriented countries and companies. This could increase the market access for Russian AAUs, or attract a premium price compared with AAUs for which revenues are not channelled through the GIS.

Priorities of state (or regional) authorities can be reflected during project selection (project size, type, location).

3.9.2 Possible advantages of GIS versus JI

Internationally approved restrictions of Article 6 of Kyoto protocol can be avoided – as a result, procedures can be simplified compared to JI. In the case of 'track two JI' the procedure of verification for every project is obligatory, which raises project costs. This is not very attractive for investors, in particular for those developing small projects. A GIS operating according to a programme approach can apply simplified verification procedures, particularly if the projects are of a type where emission reductions are easy to

quantify. Simplified procedures will also improve the attractiveness of a GIS compared to the CDM; the latter has considerable bureaucratic procedures.

Early reductions (before 2008) can be credited and transferred to investors. This will improve the economic performance of projects and help to attract early investments.

4 Contribution of a GIS to the Russian energy sector

Anna Korppoo and Jonathan Stern

4.1 Energy and the Russian economy

Energy is a crucial sector in the Russian economy. The country is one of the world's largest producers and exporters of energy, particularly oil and gas. In 2000, oil and gas export revenues accounted for nearly 22% of Gross Domestic Product (GDP) and 30% of total government revenues.[38] European countries were the recipients of nearly 95% of oil and 100% of natural gas exports outside Commonwealth of Independent State (CIS) countries. The EU alone accounted for 53% of Russian oil and 62% of gas exports in the year 2000. Russian exports of oil and gas (and, on a smaller scale, coal and electricity), imports of energy-related equipment and technology, and the involvement of foreign energy companies in Russian energy projects, all provide opportunities to add an emissions reduction dimension to energy activities. GIS can be of immense importance to the Russian energy sector for two reasons:

- attracting revenues for the modernisation of infrastructure;
- unlocking the huge potential for energy conservation and efficiency which remains unrealised within the sector.

If GIS projects can demonstrate the potential for efficiency improvements, with consequent emission reductions, these trends will be accelerated as market-based economic reform is implemented throughout the Russian economy.

After the break-up of the Soviet Union in the transition to a market economy, Russia (along with all other transition economies) experienced a very sharp decline in GDP. Despite some recovery in the late 1990s, Russian GDP in 2000 was only 64% of its 1990 level.[39] This decline in GDP was not matched by a decline in primary energy demand which, in 2000 was 74% of its 1990 level.[40] The fact that energy demand has fallen less quickly than GDP is not surprising, but the Soviet Union was a very inefficient user of energy compared with OECD countries with similar climatic conditions.[41] Hence Russia, already an energy-inefficient country in 1991, has become steadily more energy-inefficient over the past decade. Data for transition economies shows that in 1999, Russian energy intensity was slightly above the average for CIS countries, although well above levels in Central and East Europe.[42]

The Russian energy sector is dominated by large companies. In the oil sector, five partly or wholly privatised, vertically integrated oil companies – Lukoil, Yukos, Surgutneftegaz, Sibneft and Tyumen Oil Company – predominate. In gas, Gazprom is

[38] *Transition Report 2001*: Energy in transition, European Bank for Reconstruction and Development (EBRD), 2001, Table 4.1, p. 79.

[39] *Transition: the first 10 years*, World Bank, 2002, Table 1.1, p. 5.

[40] EBRD, Table 3, p. 29.

[41] For example Russian energy intensity is roughly twice that of Canada, *Russia Energy Survey 2002*, International Energy Agency, OECD/IEA, 2002, Figure 21, p. 231.

[42] EBRD Figure 5.2, p. 92.

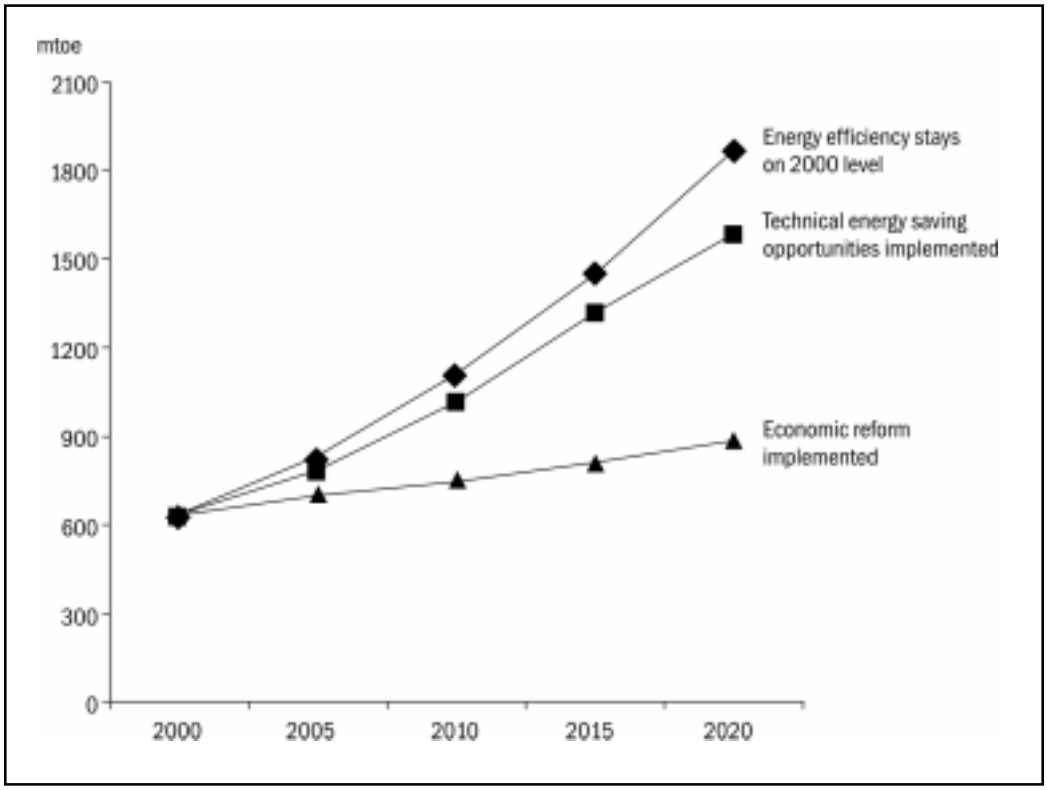
the overwhelmingly dominant producer, transporter and seller of gas to large customers and distributors. Local and municipal companies are responsible for the majority of gas distributed and sold to smaller customers. The electricity sector is dominated by United Energy Systems (RAO UES) which owns:[43]

- the majority of thermal generation (and substantial hydropower) capacity;
- substantial stakes in local electricity and heat supply companies ('energos');
- all transmission networks of 330kV and above.

Further privatisation and reform of natural monopolies is proceeding slowly, with restructuring of the gas and electricity industries into corporate entities expected to operate in a competitive market and regulated network businesses.

The National Energy Strategy, published in late 2001, covering the period up to 2020, is an important document in the development of Russian energy policy thinking.[44] More than any previous document of its type, it stresses the importance of demand reduction and the role of energy efficiency in achieving lower cost energy supply. Without significant improvements in efficiency, energy demand (see Figure 4.1) is seen as increasing from 650 million tons of oil equivalent (mtoe) in 2000 to around 1900 mtoe in 2020. If technical energy savings are implemented, the 2020 figure falls to 1600 mtoe but economic reform reduces demand to 885 mtoe in 2020. It is clear that the contribution of economic reform is anticipated as the most important (nearly 700 mtoe) compared with technology (288 mtoe). Equally significant, the figure of 885 mtoe in 2020 barely exceeds the 1990 energy demand figure of 880 mtoe.

Figure 4.1 Energy consumption growth estimates in the context of energy saving



Source: Energy Strategy of Russia for the period up to 2020, Figure 1, p.25

[43] *Russian Energy Survey 2002*, pp. 192–3.

[44] *Osnovnie Polozheniya Energeticheskiye Strategii Rossii na Period do 2020 goda* (Energy Strategy of Russia for the Period ending 2020: Main Provisions), Institute of Energy Strategy, Moscow, 2001.

The potential for energy saving has been set out in much greater detail in a federal programme, the first part of which was published in late 2001.[45] This shows in great detail the funds which are intended to be allocated to each of the fuel sectors for modernisation and energy saving.

While energy supplies are still expected to rise, the scale of the increase is far below what was foreseen in previous strategy documents.[46] Table 4.1 shows the expected increase in total primary energy production of 8–23% over a 20-year period. A potentially problematic aspect of this picture is the anticipated increase in coal production of 32–66%. Were this to happen, GHG emissions would increase substantially. However, given the investments required for such a large increase in production (with associated transportation and conversion costs for users), there must be some uncertainty as to whether it will materialise. Similar uncertainties attach to the projections of a substantial increase in electricity generated from nuclear stations.

Table 4.1 Projections of Russian Energy Supplies 2000–2020

	2000	2005	2010	2015	2020
Total primary energy (million tons oil equivalent)	991	1000–1049	1017–1110	1049–1161	1066–1217
Crude oil and condensate (million tons)	323	308–327	305–335	305–345	305–360
Natural and associated gas (billion cubic metres)	584	580–600	615–655	640–690	660–700
Coal (million tons)	258	270–300	290–335	320–370	340–430
Nuclear power (billion kilowatt hours)	131	155–175	190–205	210–260	235–340
Hydropower (billion kilowatt hours)	165	165–170	170–177	180–190	190–200
Renewable energy (mtoe)	1	2–3	4–5	6–8	8–14
Total electricity production (billion kilowatt hours)	876	970–1020	1055–1180	1135–1370	1240–1620
Total heat production (million gigacalories)	2060	2120–2185	2200–2315	2300–2470	2420–2650

Source: Ibid., Table 4, p. 47

The development of the Russian emissions is closely linked with the developments in the energy sector, which accounts for some 90% of the Russian GHG emissions and some 85% of CO_2 emissions.[47] Russian CO_2 emissions declined in line with economic activity and were some 30% below 1990 level in 2000. The new Energy Strategy intro-

[45] *Podprogramma 1 "Energoeffektivnost" Topivno-energeticheskovo Kompleksa',* Federalnaya Programma 'Energoeffektivnaya Ekonomika' na 2002-2005 godi i na perspekivu do 2010 goda, Government of the Russian Federation, Moscow, 2001.

[46] For details of the 1994 Russian Energy Strategy, see: *Energy Policies of the Russian Federation*, 1995 Survey, International Energy Agency, OECD/IEA, 1995.

[47] *Osnovnie Polozheniya Energeticheskiye Strategii Rossii na Period do 2020 goda* [Energy Strategy of Russia for the Period ending 2020: Main Provisions]. Institute of Energy Strategy. Moscow 2001.

duces two emission scenarios: favourable growth and low-growth scenarios, which both indicate that there will be surplus of AAUs available for trading during the first commitment period in 2008–2012 (Table 2). The Energy Strategy is the first Russian official source to acknowledge this.[48]

Table 4.2 CO_2 emissions of the Russian energy sector (Mt)

CO_2 emissions	1990	2000	2005	2010	2015	2020
Favourable growth scenario	2,326	1,610	1,750	1,870	2,000	2,200
Low growth scenario	2,326	1,610	1,700	1,750	1,800	1,840

Source: Energy Strategy of Russia for the period up to 2020, p. 85

4.2 Economic reform, energy pricing and energy demand

Although the Russian economy and the energy sector have changed greatly since the era of central planning, the current emphasis on energy efficiency and natural monopoly reform require further substantial moves towards market-based economic reforms, particularly as far as the pricing of, and payment for, energy products are concerned. These are extremely complex issues with a major impact on macroeconomic policies (in particular, the level of inflation) and employment levels within individual regions. There are a number of different issues, all of which are interrelated.

- The level of regulated prices for (especially) gas and electricity does not cover the costs of production and delivery to many groups of customers.
- The level of gas prices has typically been much lower than oil and coal on a calorific value basis which has caused customers to switch to gas, exacerbating the problem within that industry.
- Prices charged to residential customers are lower than those for industrial customers – the opposite relationship to the economic value to these customer groups; there is little or no 'interruptible' pricing of fuels to industrial customers – whereby customers are offered a lower price in return for disconnecting from the network during periods of high demand.
- The level of non-payment in (especially) the gas and electricity industries was extremely high during 1996–2000; this period also saw a substantial increase in non-cash payment.[49] Although payment levels have greatly improved since 2000, there remains a problem with non-cash instruments, in particular barter and various forms of 'veksels' (promissory notes).

Low price levels mean that incentives for Russian companies, let alone individual domestic customers, to save energy and invest in energy efficient plant and equipment are almost entirely absent.[50] This is a serious problem for any projects – including GIS projects – involving energy saving. Non-cash payments make it difficult for consumers to determine whether energy-saving investments are worthwhile in cash terms. Meanwhile

[48] Korppoo, Anna, Vrolijk, Christiaan and Stern, Jonathan, *Energy and Climate: Russian–European Partnership*, Workshop report, The Royal Institute of International Affairs, Energy and Environment Programme, RIIA 2001.

[49] At its height, following the 1998 financial crisis in Russia, it was estimated that less than 20% of receivables in the gas industry were being paid promptly and in cash.

[50] Residential customers face other problems such as inability to control or monitor their energy usage because of lack of thermostats or metering, particularly for heat consumption. Prices are often not transparent because they form part of the rent and are not billed separately.

perverse pricing of different fuels sends wrong signals to customers in terms of where and when they should invest.

The Russian government is well aware of these problems and has expressed a determination to move prices gradually to appropriate levels both in relative and absolute terms in the period up to 2007. One possible comparator for gas prices would be parity with prices for exports to Europe (taking transportation costs into account). During 2000–2001, the ratio of domestic to export prices rose to around 1:10, reflecting very high gas prices (linked to oil prices) and a relatively low dollar/rouble (and euro/rouble) exchange rate. But even with lower gas prices and a more favourable exchange rate, in early 2002 it was clear that price increases of more than 500 per cent would be required to equalise domestic and export prices. By spring 2002, the government had decided this was too ambitious a target, even looking five years into the future, and had adopted the target of roughly doubling gas prices to 'cost-based' levels by 2007. This would be sufficient to create substantial incentives for energy saving and efficiency, and much greater interest in GIS projects.[51]

With an increase in Russian energy demand levels since 2000, some observers have asked whether anticipated energy demand reduction will materialise. Some are even questioning whether, if energy demand – and consequent emission levels – continue to increase over the next decade, Russia will indeed have any surplus AAUs to trade after 2010. These issues involve major judgements about the future of economic and price reform and the relationship of those processes to energy demand levels. Nevertheless, our view is that current energy demand levels in Russia are not sustainable because of an inability to maintain implicit subsidies to consumers who are not paying a price that reflects the cost of production and delivery. When consumers are required to pay such prices, they will unlock the huge potential for conservation and efficiency within Russian economic structures. The structure of the Russian economy will move quickly towards new and highly energy-efficient service industries. The old energy intensive Soviet-era industries will either go out of business or be forced to invest in new energy-efficient plant.

If consumers are not required to pay such prices it will signal an important failure of economic reform, with bankrupt enterprises remaining in business and lack of replacement of capital stock. In such a situation – which reflects economic development for the latter part of the Soviet period and much of the 1990s – it will be very difficult for the Russian economy to grow significantly and energy demand is likely to remain relatively stable.

4.3 Legal and fiscal frameworks

A major barrier to investment in Russia (and other transition economies) since the break-up of the Soviet Union has been the lack of legal and fiscal frameworks which are adequate to provide confidence to investors that they will be able to predict the financial return on their investments, and have confidence they will receive that return. In that respect, GIS projects, like all other investments, will be strongly impacted by the adequacy of legal and fiscal frameworks. Thus far, major investments in energy projects by foreign companies have experienced serious difficulties in two areas: general legal and fiscal frameworks and the clash of general legislation with project-specific laws which slow down the progress of energy projects.[52]

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[51] This is a complex subject, see Russia Energy Survey 2002, pp. 126–31.

[52] See the discussion of the legislative framework and production sharing agreements in: Russia Energy Survey 2002, pp. 76–87.

As far as the general framework is concerned, the terms on which foreign parties are allowed to take ownership needs to be clear, including bankruptcy law and the rights of Russian companies to transfer assets from one subsidiary to another. Tax legislation needs to clarify the different taxes at federal level and the clash of federal versus local taxes. Much of the bad experiences of foreign investors in Russia over the past decade stems from problems of this kind. But in order to ensure that projects can move ahead quickly, it would be hugely beneficial for the Russian Federation to develop a specific legal and fiscal framework for GIS projects. Important elements of such a framework would be:

- how the ownership of AAUs will be defined;
- the percentage of equipment in support of the project which must be sourced from Russian, as opposed to foreign, sources;
- a list of all the permits – federal and regional – which a project will require;
- the tax treatment of AAUs.

4.4 Big versus small GIS projects: advantages and disadvantages

The Russian energy sector can offer a variety of projects with substantial emission reduction opportunities. In order to avoid the problems AIJ projects have experienced, i.e. institutional, implementation-level and funding related problems (see Chapter 5), it seems appropriate to devise a framework within which GIS projects should initially be established. A successful example of a possible GIS project is the Ruhrgas/Gazprom collaboration to reduce emissions by optimising gas pipeline networks (see Box 4.1). This was a relatively 'small' project with a capital cost of only a few million dollars. It could also be claimed that this project was not truly 'additional' because it used domestic Russian prices instead of international (European) prices (see the discussion of additionality at the end of this chapter). No other projects of this type have been undertaken and therefore it may need to be seen in the context of the broader relationship between the two companies.[53]

There is a difference of opinion as to whether GIS projects should be:

- big' i.e. multi tens or hundreds of millions – or even billions – of dollars, or
- 'small' –not more than $10m and as small as hundreds of thousands of dollars.

Some advantages and disadvantages of both types of project are listed in Table 4.3.

Table 4.3 Comparison of advantages and disadvantages of big and small projects

	Big	Small
Advantages	**Attractive to all investors** Single set of transaction costs Potential to be highly profitable Significant emission reductions	Quicker and easier to get approvals, funding, etc. Possible to replicate Short lead times (for replicated projects)
Disadvantages	**More difficult to obtain approvals and funding** Very long lead times Highly political Cannot be replicated	Multiple transaction costs Low profitability Insignificant emission reductions

[53] Ruhrgas is a major shareholder in Gazprom. See Arild Moe and Kristian Tangen, *The Kyoto Mechanisms and Russian Climate Policy*, RIIA: 2000, Chapter 6.

Some observers see small projects as 'a waste of time' because of very high transaction costs in Russia and the difficulty of getting any political attention and support for small projects. In addition, if each project needs to be financed separately, this may create difficulties, particularly if GIS projects are co-financed by a number of parties. Also, a very large number of small projects will be required to obtain significant emission reductions.

Our view is that small projects are the way forward – at least for early GIS projects. This is because we believe that large projects will take many years to organise and finance, while small projects – even if they are marginal in terms of emission reductions – can create some momentum for the concept and provide model projects which can be rapidly replicated elsewhere. Our suggestion therefore is that in the early stages, GIS projects should be:

- *small scale* – e.g. preferably a capital investment of less than $1 million and certainly not more than $10m;
- *technically simple* – easier for the local actors to maintain after project implementation and thus securing sustainability of the emission reduction;
- *easy to verify* – emission reductions need to be simple to verify in order to save transaction costs;
- *quick* – possible to implement within a short time frame since delays increase the probability of institutional changes and prevents the concept gaining momentum.

All of these criteria should be located within the context of national and regional priorities, as well as local (particularly employment) impact of projects. Experience of AIJ projects suggests that most of the criteria need to be fulfilled if the project is to be successful.

Box 4.1: The case of a Joint Implementation project with Ruhrgas (Germany) and Gazprom[54]

The gas pipeline project with Ruhrgas and Gazprom was recognised by the UN FCCC secretariat as a project for the JI pilot phase and introduced at COP-3 in 1997. In October 1995 Ruhrgas and Gazprom signed an agreement on long-term cooperation with a strong focus on continuing the JI project for optimising 750 km of gas transmission pipelines owned by Volgotransgaz, a Gazprom subsidiary. They assumed that optimised operation of the gas grid would achieve an actual reduction of 2.5% (75 million cubic metres) of methane leakages annually. The result of the project was presented at COP-5 in 1999 as one of the few successful pilot projects that have been commercial and successful. The case demonstrates well the replicable nature of a project for the JI pilot phase.

Data

Lifetime	:	2 years (1995–1997)
GHG Impact	:	447,000 tonnes CO_2 per annum
Carbon cost	:	1.5-3 $/t CO_2
Emission reduction	:	150,000 t CO_2/yr

[54] Sources: http://www.ruhrgas.de/englisch/umwelt/JointImpl; Table 3 in Evans et al.; Appendix 2 in Institute of Energy Strategy et al. (2001); Table 1 in Institute of Energy Strategy (1999).

Using these criteria, we believe that projects offering the *most* potential could be divided into the following categories.

Energy efficiency improvements – replacing simple, well-known technical equipment or parts in order to reduce energy consumption.

Fuel switching – switching to less carbon intensive fuels, typically from coal to gas or to bio fuel.

Renewable energy – using renewable energy supplies to replace old fossil fuel plants.

Energy network refurbishment – rebuilding or improving the existing district heating and gas transmission networks, eliminating fugitive gas emissions.

These categories are not intended to be exclusive. Projects such as collection and utilisation of associated gas would also offer substantial potential for emission reductions.

These categories overlap: for example, energy efficiency and fuel switching tend to be attractive to combine. Energy efficiency projects sometimes include fuel switching to gas where coal is main fuel.

Table 4.4 gives some examples of the different types of possible GIS projects and how these can be fitted to the suggested project criteria. Using these four types of project – efficiency, fuel switching, renewable energy and gas and heat networks – as an initial focus for investors would create useful synergies. Different types of projects – even those which do not meet the suggested criteria, may be acceptable in the context of an individual sector or region.[55] However, at an early stage of GIS, projects with large numbers of parties, long negotiations and substantial capital expenditures will be especially difficult to realise. The immediate aim should be to achieve quick implementation and success in order to give momentum to a GIS.

Portfolios of similar small projects could be a solution to reducing transaction costs and increasing the overall investment if single small projects are not desirable for an investor. Investors could, for instance, create a simple standardised project procedure and implement it in different locations with the cooperation with regional authorities. This is the 'programme approach' referred to in Chapter 3. For example, local bio-fuel projects are quite attractive for a GIS. In addition to the characteristics listed in Table 4.4, the local nature of bio-fuel projects adds to the advantages for local actors and strengthens their commitment to projects. There is an AIJ example of a successful experience similar to a project portfolio on bio-fuels.

Our emphasis on small projects is a product of experience of foreign energy companies requiring many years of organisation and negotiation even to reach agreement on a project, followed by several further years of construction and implementation. In addition, large projects have their own dynamics and are more difficult to include in a 'programme approach'. If a period of years elapses between the start of a GIS programme and the realisation of projects, then momentum may be lost.

Early GIS projects would test the strength of the institutional framework and the suggested project categories. Experiences from early projects should be reported systematically and procedures developed to expedite subsequent projects. Examples of early projects which could be prioritised include: boiler replacements; simple energy efficiency improvements in buildings, such as replacing old windows or insulation; and technically simple improvements to district heating systems. Some real project examples are available in Appendix 1.

[55] For example, even if there is no case for supporting a GIS project which increases coal utilisation because of increased GHG emissions, this may be desirable in some regions lacking other options.

Table 4.4 Some potential energy project categories and criteria for GIS projects

	Energy efficiency	Fuel switching	Renewable energy	Gas and heat networks
Small scale	Available in all sizes. However, smaller projects are possible to implement within a larger unit.	Available in all sizes, however, switching to bio fuels are often small scale and dependent on the local supply.	Typically small scale.	Available in all sizes. Small local networks or pieces of larger networks.
Technically simple	Many technically simple projects available due to the poor energy efficiency.	Basic technology. Boiler, especially if old, is often changed in order to introduce a new fuel.	Basic technologies with bio-fuels and hydropower. Wind power and more advanced bio-fuel combustion techniques likely to be too complicated.	Simple insulation; installing equipment to optimise energy use is typical. Rebuilding a network may be more complicated, due to weakness of the surrounding infrastructure.
Easy to verify	Comparing the fuel consumption before and after improvement. End users need metering equipment.	Comparing emissions from combusting different fuels.	Comparing renewable fuel source emission with emissions from replaced fossil fuel fired plant.	Closed local networks easy to measure, parts of large networks more difficult due to lack of historical data and metering equipment.
Quick	Installing standardised technology can generate technically easy improvements quickly.	Standardised technology available.	Standardised technology available.	Insulating and installing equipment which optimises energy use is quick.
Environmentally credible	Substantial emission reductions possible. Upgrading coal plants may be controversial because it supports fossil fuel utilisation in the future. However, regional differences may allow coal projects.	Aim to switch to least carbon intensive fuel. Gas and bio-fuels credible.	Brings emissions close to zero. Potential 'double effect' on emissions by both replacing fossil fuel combustion and reducing the amount of organic waste emitting CH_4 at landfill.	Reduces losses, especially methane loss reductions may provide double advantage as additional fuel and captured methane emissions. In addition, global warming potential (GWP) of CH_4 is much higher than that of CO_2.
Economically attractive	Fuel savings, however, current fuel prices give wrong signals for economic advantages	Local bio-fuels contribute to fuel supply security and may provide extra income to local fuel suppliers. Gas currently cheaper than oil and coal.	Adds value to local renewable fuel supplies which may be unused and even emitting GHGs (bio-fuels). When the economic reform develops, coal and oil prices likely to include transport.	Insulation of gas pipelines often profitable due to gas export.

4.5 Recommendations for the design of the GIS

The fact that energy demand has fallen less quickly than GDP, has created a huge potential for a mechanism such as GIS to accelerate the efficiency of the energy sector. Even if the largest potential to save energy is related to economic reform, the technological energy saving opportunities are substantial – nearly 290 mtoe up to 2020 – which shows the potential for GIS projects.

Because of uncertainty as to whether, and how quickly, the Russian Energy Strategy and other programmes will be implemented, GIS has to be an arrangement independent of these programmes. Nevertheless, the focus of the Energy Strategy on energy efficiency and energy demand reduction are powerful tools to justify GIS politically.

The GIS should be designed to protect projects from the problems of the Russian investment climate. GIS investors will have to be able to cope with low profitability until price reform arrives. The Russian energy sector consists of a few large actors and a

number of smaller local actors. Potential partners in GIS projects will be drawn from these two categories. Cooperating with large actors may be problematic in terms of getting attention for relatively small projects.

Creating project categories may be attractive because it would provide GIS with some concrete guidelines for implementation. Foreign investor support for these categories would render GIS more attractive and urgent for Russian participants. It would also be easier for Russian actors to propose a project if foreign investors made clear which categories they favoured and what type of standardised procedures might provide a quicker and easier project cycle with economic benefits from learning by doing over time. Transaction costs may decrease substantially if the Russian actors understand the standardised approach of an investor and which projects are likely to be accepted.

Combining different project categories on the site of a single project has the potential to reduce transaction costs per reduction unit. For example, it can be advantageous to combine energy efficiency with fuel switching or network refurbishment, producing further efficiency improvements in energy supply. This has been common with AIJ projects where some investors have divided different activities at one project site into sub-projects, which would support the idea of starting with small projects as suggested above for GIS.

4.5.1 The issue of additionality

The question of how energy-related projects should be viewed in terms of additionality is complicated in both conceptual and practical terms. The present state of the Russian economy, where energy prices are often too low to cover costs of production and delivery even if paid promptly and in cash, makes it possible to argue that all energy efficiency (and many supply) projects are 'additional', i.e. they will not happen in the absence of a special climate-related programme of assistance. However, it is also possible to argue that, with the coming of price reform in Russia, very few energy efficiency or supply projects will be 'additional' because they will all be profitable investments for commercial companies. We may therefore face the slightly curious situation that, in the absence of economic reform in Russia, all energy projects are additional, but once market reforms are implemented none will be considered additional. This is a problem which a GIS proposal needs to consider, but it should not prevent a GIS programme from being implemented. It may simply suggest the need for periodic review of the type of projects being selected under a GIS programme, depending on the speed of economic reform in the Russian energy sector.

5 Institutional barriers and lessons of previous agreements for the GIS in Russia

Anna Korppoo and Jonathan Stern

5.1 Russian climate policy

The basis for the Russian domestic institutional framework for climate change mitigation was set up in 1994 by establishing the Inter-Agency Commission on climate change problems (ICC).[56] The main tasks of the Commission consist of:

coordinating the work of the domestic agencies;

coordinating the implementation of the UN FCCC in Russia;

organising and coordinating the Russian participation in the official activities of the UN FCCC and international cooperation.[57]

The Commission has been chaired by the head of Roshydromet from the very beginning. The Ministry of Economic Development and Trade (MEDT) was introduced as a co-chair of the ICC with Roshydromet in 1999. In 2001, a Russian representative from the MEDT was elected in the UN FCCC Bureau.[58]

Other key players in the Russian climate policy are the responsible ministries, namely: the Ministry of Energy, the Ministry of Natural Resources and the Ministry of Foreign Affairs. The State Duma has become more active since the pre-COP-6 discussion on the Russian national position in the negotiations.[59]

5.2 Institutional confusion

Most countries have nominated a ministry to lead the national climate policy and divided responsibilities of single issues to other ministries and agencies. Authority is a significant factor contributing to the importance of climate policy within a country. A lead government ministry can exert authority over other domestic and international actors, quite a few of which will also be ministries. The designation by the Russian government of a leading *agency*, rather than a *ministry*, has been problematic domestically and created confusion for international cooperation initiatives.

As the official leading agency of the Russian climate policy and as the co-chair of the ICC, Roshydromet has been required to coordinate agencies more politically powerful than itself. With its traditional focus on scientific research, Roshydromet has no capacity to implement climate-related industrial projects. In addition, the agency claims to have only minimal funds available for leading a national climate policy.[60]

The lack of efficient and transparent decision-making authority and the lack of clarity in division of detailed responsibilities have made it difficult for foreign investors to know

[56] For a list of organisations members of the ICC, please see Appendix 2.

[57] Resolution of the Government of the Russian Federation No. 346, 10 April, 1994. http://cpc.hydromet.ru/texts/normdocs/doc0006.htm

[58] FCCC/CP/2001/13

[59] Moe *et al.* (2001).

[60] Interview with a representative of the Roshydromet. 26 July 2001, Bonn.

who is in charge of what. Various actors, such as ministries and private sector actors, have their own plans and programmes for attracting foreign investments for projects, but have no right to register them under the UN FCCC without the approval of the ICC. Consequently, the problems of registering projects with Roshydromet cannot be avoided by cooperating with other agencies. And even if a project is approved, there is no guarantee of being able to transfer credits at later stage.

It is uncertain how the institutional confusion in Russian climate policy will be resolved. The MEDT was apparently introduced as a co-chair of the ICC in order to solve these problems and has been expected to take the official lead in the national climate policy since 1999. MEDT is a powerful ministry in the Russian government, with considerably more political weight than Roshydromet. The political power and skills of MEDT would be sufficient to reform the institutional basis and assume decision-making authority of Russian climate policy. However, the institutional reorganisation has yet to take place.

Institutional and economic interests dominate the Russian climate policy and the Kyoto mechanisms related interests are the main driving force of the Russian discussion. The main cause of projects not being implemented in Russia is confusion and ineffectiveness of the Russian institutional framework. The lack of foreign investments in projects reduces the incentive of Russian actors to reform the institutional system, creating a vicious circle of climate-related investments in Russia, illustrated in Figure 5.1. It is impossible for the foreign investors to change this situation: the vicious circle can only be broken by the Russian actors themselves by establishing an effective decision-making framework.

Figure 5.1 The vicious circle of climate-related investments in Russia

The lack of force to solve the institutional problems has several explanations. First of all climate policy has not enjoyed a high priority on the crowded Russian political agenda. Thus, despite the efforts of some federal bodies, regions and companies, which have shown a strong interest in Kyoto related projects, the engagement of the top political level that would be required to reform the institutional set-up has been lacking. For the same reason, budget allocations for institutional development have been very modest. It is expected that foreign assistance for capacity building will be significant, but, as long as the Russian government appears undecided and uncommitted, such assistance cannot be effective and will probably not be forthcoming. The crucial issue is ratification of the

Kyoto Protocol. With ratification in place – or at the least an unambiguous commitment from the Russian government to ratify, much can change and it can change quite fast. The difficult issue at this stage is whether the political and institutional leadership supporting ratification is sufficiently strong. Open, candid discussions with foreign counterparts on the development of the international climate regime, as well as distribution of information to a wider Russian audience, will continue to be beneficial but are not a substitute for a commitment to ratify.

5.3 Lessons learned from previous projects[61]

There have been relatively few project level studies and real climate and energy projects in Russia, and experiences have not been encouraging. The project experience of the Activities Implemented Jointly (AIJ) pilot phase under the UN FCCC is relevant for GIS due to its main focus on GHG emission reductions. The experience is limited to nine officially registered projects and some 25 similar but unregistered projects or project plans. Five of the nine registered projects were either cancelled or have been delayed. The following assessment of the Russian AIJ projects is based on six official and 23 unofficial projects. For more information on the projects covered please see Table 5.1. and Appendix 3.

In addition to this project experience, there have been 30 pre-feasibility studies implemented by a Japanese government programme in 1998–1999 promoted by the Hashimoto–Yeltsin plan.[62] Seventy per cent of the potential projects studied are energy projects, most of which focus on converting coal and gas power stations to combined cycle plants. If successfully implemented, these projects could provide Japan with 50 $MtCO_2$ contribution to be used for achieving its Kyoto target. There are no experiences available from these projects since the Japanese pre-feasibility studies never moved towards implementation, although two projects have been the subject of further negotiations between the Japanese and Russian governments. These experiences have not been reflected in the results below.

Stakeholders of 29 projects, six of which are AIJ, provided their input to the following discussion. Nine of these 29 projects were cancelled or delayed.

Table 5.1 Status of the projects assessed

	Completed	In progress	Cancelled or delayed	No information	TOTAL
Registered	3		3		6
Unregistered	14	1	6	2	23

Table 5.1 (and discussion above) shows that a significant share of the projects implemented and prepared in Russia have not been officially registered as AIJ. This can be interpreted as a strategy by investors to avoid institutional problems experienced with some Russian actors. Some of these project investors first tried to register the projects but then chose to implement them without registration. Only one project is reported to be still in progress, which illustrates the stagnation of the project implementation in Russia despite the fact that the AIJ phase is ongoing and some early JI programmes have already been launched by investors.

[61] This chapter is based on Korppoo (2002).

[62] For a list of projects see Appendix 4.

Table 5.2 Problem types experienced by projects

Problem type	Total	Registered	Unregistered
Institutional			
Institutional structure	26	3	23
Legislation	24	4	20
Requirements of investors	12	3	9
Implementation			
Local infrastructure, material quality	14	0	14
Implementation level cooperation	7	2	5
Local expertise and staff	14	0	14
Funding related			
Lack of funding and local economic support	13	4	9
Investment climate unfavourable	10	3	7

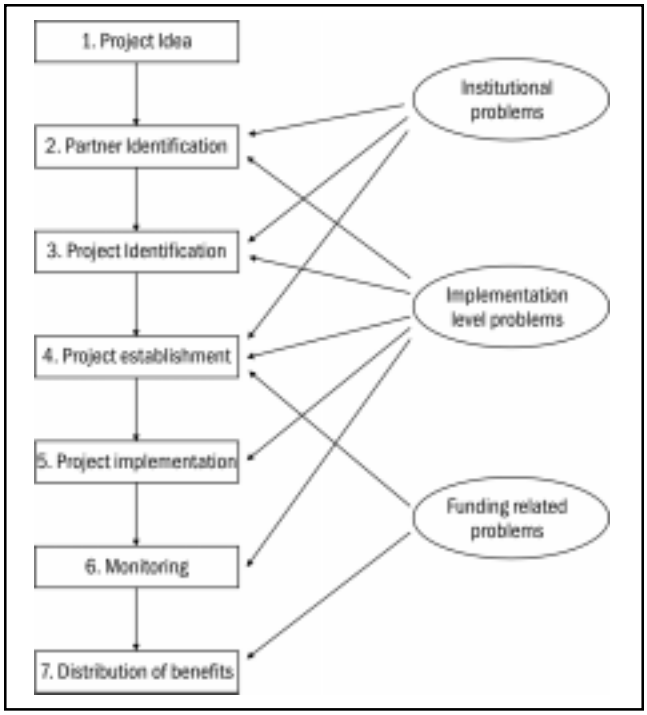
Source: Based on interviews and other exchange with the governmental and other actors involved in AIJ investments in Russia reported in Korppoo (2002)

Problems experienced can be divided into three categories: institutional, implementation-level and funding-related. The second category refers to cooperation with Russian actors other than the leading agency which is considered as part of the institutional system.

Table 5.2 shows the problem types experienced by the investors and their significance. The importance of institutional problems is obvious. Other significant problems were caused by the local level infrastructure and staff, and lack of funding. Institutional issues have caused more problems for unregistered projects than for those officially registered. This reflects at least partly the problems experienced with the registration process. Lack of funding has been a more relevant problem to the registered projects than non-registered projects. This reflects the private sector funding-based strategies of individual investor governments.

From the standpoint of a GIS, the main question is the processes through which investors will need to move during the preparation of a project. Figure 5.2 shows the main problem categories experienced by project investors in a prototype JI project cycle.

Figure 5.2 JI project cycle with problem categories experienced by AIJ investors



5.3.1 Institutional problems

As can be seen in Figure 5.2, the initial set of problems has been related to the Russian institutional structure. This includes difficulties with the Russian climate institutions, legislation and the institutional requirements of investor governments. About half of the problems experienced can be categorised as institutional. These contributed to several project failures (6 of 9 cancelled or delayed projects) at an early stage of the process.

The institutional structure of the Russian climate change administration, lacking a strong national focal point leaves foreign investors more or less on their own in trying to develop projects. In addition, some agencies are charging for registering AIJ projects, and registration process is slow because the ICC has failed to organise meetings since 1999; consequently, no new AIJ projects have been registered since that date. Even obtaining a signature on a memorandum of understanding or a letter of intent has been difficult. Lack of clarity concerning the agency to contact in Russia in order to establish cooperation adds to these problems; agencies other than Roshydromet have not been able to register projects even if they wished to do so. The role of regional authorities, which often are involved in implementation, has been unclear and under discussion at the national level. At present they have limited rights to manage JI projects themselves. This sub-category is the most significant, causing more than 25% of all problems reported.

Legislation is unclear because the legislative, regulatory and taxation system is continually changing. The most important legislation-related problem was caused by customs' rules hindering the import of equipment into Russia. Customs' procedures have led to delays and entailed additional costs, especially if a project is not registered as AIJ. This problem was reported by 16 projects. Lack of clear land ownership legislation and established levels for Value Added Tax (VAT) and other taxes caused problems. Legislation caused more than 20% of the problems reported.

Institutional requirements of investing governments for cooperation on AIJ projects often include a Memorandum of Understanding (MoU), which is a bilateral framework contract on climate cooperation. Lack of an MoU is a barrier for proceeding with project proposals on domestic level for some investor governments and, consequently, may prevent approval of any projects. Some governments do not regard MoU as an important element of cooperation. Problems with signing such agreements have occurred due to the lack of clarity on the division of responsibilities: different ministries could potentially sign an MoU with an equivalent foreign ministry of an investor country, but have been reluctant to do so because the roles of ministries in the domestic climate administration are unclear and constantly changing. Lack of an MoU influenced more than 40% of projects.

5.3.2 Implementation-level problems

These problems, accounting for some 30% of the total problems experienced, affect projects from the stage of partner identification all the way through to the monitoring stage.

Implementation-level cooperation is about finding a local partner and identifying a project of common interest and benefits. It is difficult to find Russian partners who are committed to project implementation. This sub-category was not very significant accounting for just some 5% of all the problems experienced, however, almost 25% of investors had some problems with their Russian hosts. But some of the problems experienced were serious: the lack of commitment on the host side has been regarded as the main cause of two out of nine project failures. The positive influence of the assistance and support by regional administrations was emphasised by the foreign investors, many of whom recommended their involvement.

The lack of local technical expertise is a problem for project implementation. It is difficult to confirm that the technical infrastructure created by a project will be properly maintained and used after the project has commenced. Thus some investing governments include education of local experts. in their AIJ projects. Turnover of technically trained staff has caused problems for some projects. Altogether local staff-related problems accounted for some 15% of problems and were cited in almost half of the projects.

Local infrastructure and material quality-related problems were experienced by half of the projects. Inadequacy and lack of local technical infrastructure caused failures of project activities, adding to costs. Defective postal services and telephone connections were also reported. Poor service quality, such as dirty water and variable quality of biofuel, caused additional costs.

5.3.3 Funding-related problems

These problems emerge with the establishment of a project and at the end of the project cycle if additional costs and delays have had a negative impact on project deliverables. More than half of projects reported funding-related problems. This category of problems has a more significant impact on private sector projects.

Transaction costs are typically high in Russia due to the unpredictability of the economy. Additional transaction costs are caused by problems in all categories and, consequently, difficult to put into figures. However, the majority of the projects reported problems which could have led to additional transaction costs. Additional transaction costs have been caused by delays in negotiations, equipment import-related delays and customs' fees, delays with loan payments, etc. The economic integrity of projects is at risk due to these potential unexpected costs and delays. Some changes influence the GHG reductions that can be achieved, thereby reducing the economic return of the project.

Lack of funding and/or local economic support was experienced by 20% of cancelled or delayed projects. There is hardly any local co-funding available for projects due to economic problems and the lack of energy-saving incentives resulting from low energy prices. The rules of the Kyoto Protocol create little incentive to fund AIJ projects which are focused on learning-by-doing of projects similar to JI, with a strong orientation to GHG emission reductions, but without a commercial value for reductions achieved. The most successful projects in terms of implementation have often been those funded (at least partly) by governments. In two out of 29 projects, repayment of loans to investors were affected by delays in payments by domestic customers to the local host company.

Most of the funding-related problems discussed reflect the unfavourable *investment climate* in Russia. This was especially recognised by some 35% of project investors.

5.4 The way forward

The problems categorised above have caused major barriers to project implementation in Russia. The initial problems are typically institutional, which are often the cause of early project failure. The current institutional framework is inadequate. It has failed to serve AIJ pilot phase needs or attract JI projects so far, let alone the future Kyoto Protocol implementation needs. It was established when both the Kyoto regime and the Russian governance system were at an early stage. In order to solve the institutional problems and proceed beyond Item 3 of Figure 5.2, a new institutional system needs to be created. A single ministry with high-level support should be put in charge of the Russian climate policy and international cooperation on climate. In April 2002 the Russian government suggested reorganising the responsibilities of federal level actors involved in climate

change administration.[63] Resolution of this problem would also assist the difficulties encountered throughout Figure 5.2.

Implementation-level problems can be avoided by choosing project partners carefully. Continuity of relations involving the Russian partners at every stage of the project cycle has produced good results for investors in AIJ and other projects. Involving regional authorities is recommended by investors due to their support in negotiating with federal authorities. In addition, local co-funders have been mentioned as a way of making a Russian partner more committed. All of which suggests that the implementation-level problems can be solved.

Past experience shows that the climate-related projects have not always covered their costs for three principal reasons:

- a relatively unfavourable investment climate;
- high transaction costs combined with unforeseen expenses (including those caused by project delays);
- the Kyoto Protocol cannot provide credits from emission reductions in Russia prior to the year 2008.

As long as there is no market for carbon dioxide emissions and projects cannot be credited, AIJ type projects are unlikely to happen as private sector initiatives. GIS, based on future trading, would solve the lack of crediting prior to 2008. And the Russian investment climate, including that for GIS projects, is slowly improving.

[63] Russian Government (2002), Press Release #580, 11 April 2002. Part 2: *On the preparation of the ratification of the Kyoto Protocol to the UN Framework Convention on Climate Change* (O podgotovke k ratifikatsii Kiotskovo Protokola k ramotsnoj konventsii OON ob izmenenii klimata) (available in Russian at http://www.government.ru/2002/04/11/1018528303.html).

6 Fitting a GIS into the EU–Russian framework of cooperation

Christian Egenhofer, Michael Emerson, Noriko Fujiwara and Thomas Legge

6.1 Introduction

The European Union is likely to play a significant role in the development of a GIS, despite the fact that demand for AAUs will probably be small in the EU. The EU's main interest is not the demand for AAUs within the European Union, which is expected to be low – firstly, because of most EU member states' intent to meet their commitments through domestic policies and measures, and, secondly, because of public opposition in the EU to the use of IET to comply with the Kyoto Protocol. The EU has a threefold interest in the development of a GIS. First, there is likely to be strong interest from Europe's business community for a GIS that will provide opportunities for investment outside the EU. Second, the EU has a general interest in the architecture of the Kyoto Protocol and will want to be engaged in the development of such an important new policy instrument, particularly one that provides additional incentives for Russia to ratify. Third, and perhaps most importantly, the GIS could complement the existing dialogues between the EU and the Russian Federation, particularly those related to energy policy.

This chapter will first assess the EU's climate policies and outline the likely demand for AAUs on the international market. The EU's proposed emission-trading regime is sketched and its possible relation with the GIS is examined; it is argued that it will be difficult to link the GIS to this scheme, but future linkages are not ruled out. Second, the chapter examines the likely implications of surplus emission allowances arising in the future EU member states in central and Eastern Europe. Finally, the chapter examines the state of EU-Russian relations and the implications this could have for a coordinated approach to the two areas of energy cooperation and international environmental cooperation.

6.2 Climate policy in the European Union

The European Union is obliged under the Kyoto Protocol to reduce its GHG emissions by 8 per cent below 1990 levels by 2010. To be in compliance, the EU's 15 member states are expected to need to reduce their collective emissions by about 336 $MtCO_2e$ per annum by 2010.[64] The European Commission has outlined a package of measures to meet this goal including: promotion of cogeneration, increased use of electricity from renewable energy sources, energy efficiency standards for buildings and appliances, voluntary agreements with car manufacturers and other industry sectors, methane capture and directives on fluorinated gases. According to the Commission, these measures could yield twice the required amount of emission reductions at a price of €20, or less, per tonne of CO_2 equivalent.[65] The overall emphasis in EU climate-change policy is on domestic policies and measures rather than the Kyoto Protocol's flexible mechanisms.

[64]European Environment Agency (2001)

[65]European Commission (2001b)

6.3 The EU-wide emissions trading scheme

The centrepiece of the EU's climate change policy mix is a proposed EU-wide emissions trading scheme. The European Commission proposes to establish a trading scheme for CO_2 that is limited to fixed-point large emitters of CO_2.[66] Entities (i.e. factories and electricity producers, etc.), rather than parties (i.e. countries), are allowed to trade. The proposed EU-wide scheme should not therefore be confused with IET. The EU trading scheme is an internal environmental instrument that only covers a section of the EU economic sector and represents just one part of the EU's abatement effort. It is legally and technically separate from IET and, as such, will not be open to the trade of AAUs, although it is intended to be compatible with IET.[67]

Nevertheless, the proposed trading scheme is intended to be open to credits from outside. The proposed directive explicitly anticipates the linking of the EU-wide scheme to similar schemes in third (non-EU) countries (Article 24). The European Commission is also considering proposing a new directive that would allow credits from the Kyoto Protocol project mechanisms to be tradable within the EU system. It is therefore worth considering the possibility of linking a GIS to the proposed EU-wide scheme.[68]

First, any linkage of the GIS to the EU-wide scheme would have to cross a high environmental threshold. The Commission's proposal anticipates the linkage of the EU-wide trading scheme with similar schemes in other countries, but only on condition that the other schemes' allowances meet certain environmental and other standards.[69] Moreover, the design of the GIS and the EU trading schemes are so different that they will be hard to integrate. Under the proposed EU-scheme, individual installations are allocated emissions allowances according to a defined set of criteria. One allocation criteria can be seen as a ban against surplus AAUs.[70] The differences between a GIS and the proposed EU scheme are quite striking. A GIS will not imply allocation of allowances to single installations, and it is funded by sales of surplus AAUs. The proposed EU trading scheme, in contrast, foresees allocation to single installations and will be designed to prevent allocation of more allowances than should be needed.

A new proposal from the European Commission regarding the use of the project-based Kyoto mechanisms is expected to be published in 2002–early 2003, and this might present an option for integrating the GIS into EU climate policy. Whether a GIS will qualify as a project mechanism under the forthcoming directive depends on the criteria that the EU establishes for the project mechanisms. However, it seems likely that the EU will follow the rules established in the Kyoto Protocol, which means that emissions reductions will be credited after they have taken place. This could make it difficult to integrate a GIS where sales of AAUs take place before project implementation. Consequently, it seems to be most realistic that a GIS would be negotiated and implemented as an agreement separate from the proposed EU directives on emissions trading and the project mechanism. This gives greater freedom regarding the set-up, since a GIS institutionally and financially separated from other EU instruments will not have to be designed with the purpose of being integrated with them.

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[66] European Commission (2001b).

[67] For more information on the proposed EU-wide trading scheme, see Appendix 5. For a detailed overview, see Egenhofer and Legge (forthcoming).

[68] The following section is based on input by Kristian Tangen, FNI.

[69] The proposal states that: 'Before concluding such an agreement [linking of emission trading schemes], each government would want to satisfy itself that the environmental quality of allowances issued elsewhere is satisfactory and that monitoring, compliance and national registry provisions are robust', European Commission 2001e, p. 16.

[70] '... nor shall any installation be allocated more allowances than it is likely to need', European Commission 2001e, Annex III.5.

6.4 The implications of EU enlargement for the GIS

The expected accession of the central and eastern European countries (CEECs) to the European Union will have implications for the development of a GIS. A total of eight CEECs, as well as Malta and Cyprus (currently non-Annex 1 countries), are expected to accede to the European Union by 2004–2005, with Bulgaria and Romania due to follow some years later. Thus, by the time that implementation of a GIS would start, most of the CEECs will be full EU member states. Even in the current pre-accession phase, these countries are *partially* integrated into the EU decision-making process, through, for example, their observer status at the European Council and the European Convention, and in the application of European Community competition law.

Surplus AAUs are not unique to Russia and other CIS countries. In fact, all the CEECs are expected to beat their Kyoto targets under business-as-usual conditions (see also Chapter 2). Projections vary, but the CEECs could have as much as 360 $mtCO_2e$ surplus emissions per annum in 2010. As a result, the CEECs and Russia (as well as the Ukraine) are theoretically competitors in the global IET market. One implication is that the CEECs might prefer to keep Russian excess AAUs out of the EU, giving CEECs the possibility to make up for a possible shortfall in the old EU-15. On the other hand, there is a shared agenda between CEECs, Russia and the EU-15 to establish an international emissions-trading market, and the GIS could generate the right incentives to make this a reality. Thus, on the CEEC side there are incentives both for and against the GIS. Much will depend on how CEECs see demand and prices evolving in the current EU member states. If the EU-15 meets its commitments largely without CEEC AAUs, and demand (and therefore prices) is consequently low, the CEECs might be more favourable towards the GIS as a catalyst for IET. Still, apart from diluting Russia's status as dominant seller of AAUs, the CEECs' surplus AAUs could reduce EU demand for Russian GIS in another way. The EU-15 might demand that the CEEC accession countries surrender some of their surplus AAUs to the current 15 member states in recognition of the fact that some of the AAUs are at least partially due to pre- and post-accession EU-funded investments in the CEECs' economy.[71]

The GIS might also be affected indirectly by competition for investment between CEECs and Russia. Given the considerable investment needs for CEECs, which for the environment is estimated at about €120 billion in total for all accession countries, the EU and accession countries alike might be cautious about a GIS that diverted (private) environmental investment in CEECs.[72] Whether this will play out in reality, however, depends on the investment climate in CEECs, among other factors.

6.5 EU demand for AAUs

These two factors – the emphasis in EU climate policy on domestic policies and measures, on the one hand, and the likely availability of surplus AAUs in the EU's nearest neighbours to the east, on the other hand – conspire to suggest that the EU will have low demand for Russian AAUs. This perception must be qualified, however. Although the proposed EU-wide emissions trading scheme appears 'insulated' from AAUs, this does not mean that the EU will not need to purchase AAUs on the IET market. As outlined above, the EU-wide emissions trading scheme represents only part of the EU's abatement effort. The other sectors of the economy are covered by different policies and

[71] This issue has not yet arisen in negotiations between the EU and the accession countries, but might become the subject of negotiations prior to accession.

[72] Some CEECs, such as Hungary, attracted ten times as much investment from the EU per capita as the Russian Federation between 1994 and 1999 (Patten 2001).

measures, but GHG emissions in some sectors, particularly housing and transport, may be difficult to constrain. Notwithstanding the scope for cost-effective GHG emission reductions through domestic policies and measures, certain member states may wish to take advantage of the Kyoto Protocol's flexible mechanisms regardless (The Netherlands, for instance, expects to meet part of its Kyoto target through JI and the CDM and has already set up a government agency to manage projects (Carboncredits.nl)). In addition, some member states might wish to purchase AAUs as a guarantee against a high-cost domestic GHG abatement programme or to bank for use in future Kyoto Protocol commitment periods.

A further important reason for EU interest is that a GIS would legitimise IET and thereby open up an additional source of credits for EU member states, particularly those that are far from their Kyoto targets. The current political opposition to using IET would certainly be reduced by a GIS, because governments would be able to demonstrate that IET was leading to certifiable emission reductions beyond those that would have happened anyway. For this reason, EU member states have a keen interest in creating an instrument that would create possible further supplies of low-cost emission-reduction credits.

6.6 The GIS and EU–Russian relations

Ultimately, the EU's interest in a GIS could be decided by the role the GIS could play in the deepening relationship between the European Union and Russia. This relationship is based on the mutual acknowledgement between the EU and Russia of a 'strategic partnership' rather than ad hoc interests. The EU's approach to Russia is based less on the concept of realpolitik than (economic) integration, with an emphasis on civilian rather than military instruments and rationales and a reliance on contractual arrangements and institutions to achieve policy objectives. The long-term objective is to integrate the Russian economy into a European economic area and, effectively, to integrate Russian society into European society.[73] Energy policy, and consequently climate policy, is a priority issue related to such areas as economic integration (including energy trade) and common security aspects (including energy supply security).[74] The EU–Russian energy dialogue is the farthest advanced initiative to realise this objective; it also holds the greatest promise for cooperation related to climate policy.

6.7 The EU–Russian Energy Dialogue

Formally launched at the 6th EU-Russian Summit in Paris in October 2000, the Energy Dialogue broadly reflects the common interest shared by Russia, as the primary supplier to the EU's energy market, and the EU – a very large energy market in immediate proximity to Russia. Russia is the primary supplier to the EU's energy market; oil and natural gas account for about 60% of Russia's total exports to the EU. In 2000, EU energy imports from Russia amounted to about €20 billion, or 62 per cent of total Russian

[73] The European economic area (EEA) is a concept that allows for the full (and legally binding) integration of countries into the EU's internal market without being members of the EU. This concept has been applied to Norway, Liechtenstein and Iceland. For Russia, the EEA should be understood as a long-term prospective (i.e. a sign post) rather than a short-term possibility, but it could cause gradual approximation between the EU's and Russia's economic regulation (see Emerson et al. 2002).

[74] The term 'strategic partnership' was used in the strategy documents exchanged in 1999 in the framework of the Partnership and Co-operation Agreement (PCA). See Emerson et al. (2001) for a more thorough treatment of the evolving EU–Russian strategic partnership.

exports. Russia provides 16% of EU oil and 28.4% of gas consumption. The energy sector accounts for 30% of foreign direct investments in Russia.[75] Both Russia and the EU desire reliability and growth of energy trade, and both also recognise the need to modernise the Russian energy sector, to enhance its technology base and improve energy efficiency, and to reduce greenhouse gas emissions from energy production and use.

The Energy Dialogue works according to four thematic groups: energy strategies and balances, investment, technology transfer and energy infrastructure, and energy efficiency and environment. Given that the EU has chosen the Energy Dialogue as the main vehicle for EU–Russia energy co-operation, the Dialogue would seem to be the appropriate forum for EU–Russian discussion about a GIS. Although the Dialogue does yet not make explicit reference to the GIS – which, in any case, is a rather recent proposal – it identifies the link between modernisation, investment, energy efficiency and greenhouse gas emissions that is central to the GIS. In the documents related to the Dialogue, the basic concept behind the GIS – linking revenues from sales of GHG emitting allowances to investment in energy efficiency – seems to appear although, as one could expect, 'conditionality' is nowhere explicitly spelled out. The second progress report of the EU–Russian Energy Dialogue made specific reference to the 'potential of the Kyoto Protocol to offer economic incentives for energy savings and improved energy efficiencies'.[76]

6.8 Where from here?

According to the concepts discussed in this paper, as and when the EU gets more deeply into refining its energy relationship with Russia to include both climate change and conventional energy supply aspects, it will be looking at a four-instrument game:

- *conventional investment* and trade business, in which Russia may (or may not) make itself attractive for large-scale EU investment;
- the *Joint Implementation* route, in which EU companies would get credits from 2008 from investments that were certified to reduce CO_2 emissions;
- the *International Emissions Trading* route, in which EU member states might in theory buy relatively inexpensive Russian AAUs, although this is likely to be restricted in practice by political opposition to unconditional trading and the availability of AAUs from the new EU member states;
- the *Green Investment Scheme* route, which would represent a hybrid mechanism combining features from the first three.

The question is how the various interests in these four options would be likely to play out, first at the level of intra-EU negotiation and then at the level of negotiation with Russia.

It is increasingly likely that the EU will set up its own internal emissions trading scheme, with strong CO_2 'creditor' interests coming into the EU with the newly acceding central European states, which under some circumstances might want to keep Russian AAUs out. The old EU member states, some likely to be CO_2 'debtors' and pressed by domestic industry to find cheap abatement possibilities, will at first sight have opposite interests in wanting to open up the IET market to cheaper Russian credits, although with some environmental conditionality. However, the further element in this balance of interests is that the newly acceding central European states are being required to achieve high EU environmental standards, which the EU is being expected to pay for either by budget subsidies or, possibly, by a protected IET market. This means a complex internal

[75]European Commission (2001a). Oil production accounts for 34.8% of total investments in Russia (see Kreindel 2002).

[76]Kristenko and Lamoureux (2002).

EU set of trade-offs between the financial interests of private companies and public budgets in the rich old member states. The outcome of this future hypothetical negotiation process is at this stage quite unclear, except to say that there will be serious pressures to limit EU companies' access to cheaper Russian AAUs.

It is also clear that the EU will be relatively attracted by JI and/or GIS schemes to the extent that these mechanisms will guarantee delivery of real GHG emission reductions in Russia. Even if the EU's interest in IET, GIS or JI mechanisms with Russia will be, in some degree, constrained by its internal balance of interests (including the enlargement aspect mentioned), it is also clear that the EU retains a major strategic interest in some kind of large-scale energy investment deal with Russia on two grounds. The first is energy supply security, which has grown in importance post-11 September. The second is environmental security, especially the objective of tackling global warming, beyond the EU's own Kyoto obligations. These two objectives together are synergetic: if Russia's long-term energy reform strategy for the next 20 years were to succeed, this would be a huge double boost for both objectives, given that there would be a cleaner energy sector and more room for net exports of oil, gas and electricity to the EU.

These strategic interests of the EU should ultimately prove strong enough to justify major action in some cocktail of the four mechanisms listed, including GIS. The analysis of how the trade-offs between them would play out, and indeed the sum total of the actions under all of them, will also be strongly dependent on the Russian policies and investment climate conditions which will be on offer. The EU–Russia Energy Dialogue should properly embraces all these issues.

In general, EU–Russia relations seem to be getting better and better. There is evident interest at summit level at trying to push the relationship ahead in all domains – economic, political and security. There are clear political and strategic reasons why this should be so, ranging from Russia's own 'European choice' through to the EU's conception of its own interests, which include specific energy supply and environmental security points, as well as the desire for deep and stable interdependence with its major neighbour. One may anticipate that the EU will want to work towards operational mechanisms with Russia in the energy supply and climate change fields patiently, thoroughly and cautiously. This is hardly surprising because of the technical complexity of the conceivable mechanisms, combined with the need for sufficient convergence on such matters as governmental implementation and corporate governance standards.

7 Japanese expectations of GIS[77]

Taishi Sugiyama, Ken Yamaguchi

7.1 Japanese emission reduction requirements for Kyoto compliance

7.1.1 Overview

Japan's GHG emissions have grown at a rate slower than the US but at a higher rate than Europe, as shown below. Overall GHG emission as of 1999 was 1,307 $MtCO_2$, which is 6.8% above the Kyoto baseline, putting Japan as the fourth largest emitter after the US, China and Russia. CO_2 emissions grew by about 10% during the period of 1990–1996, but have since declined. This relatively slow growth in emissions is due mainly to economic stagnation, but factors such as increased availability of nuclear power plants can also be said to have contributed.

One notable characteristic is that CO_2 comprises over 90% of all GHGs (93.7% in 1999). This means that reduction of other gases, which are often the most cost-effective and readily available option in many other countries, are not available, and that GHG reduction in Japan is inextricably linked to energy profile.[78]

Table 7.1 GHG emissions profile in Japan, 1990–1999

	1990	1995	1999
CO_2	1,124.4	***1,217.8***	**1,225.0**
CH_4	30.5	***29.5***	**27.0**
N_2O	20.8	***21.8***	**16.5**
HFC	**NA**	20.0	**19.5**
PFC	**NA**	11.4	**11.0**
SF_6	**NA**	16.7	**8.4**
Total	**1,175.6**	**1,317.3**	**1,307.4**

Source: Japanese Ministry of Environment (2001)

Notes: The figures used for baseline are indicated in bold. 'Baseline' is that under the Kyoto Protocol, i.e. 1990 emissions of CO_2, CH_4 and N_2O, plus 1995 emissions of HFC, PFC and SF_6. Italic denotes figures only for CO_2, CH_4 and N_2O)

[77] This chapter describes Japanese expectations of GIS, with background information on such areas as energy and emissions trends and experience of relevant project activities. While the expectations are based on knowledge and experience of governmental, business and environmental stakeholders, only theoretical possibilities were raised during the discussions. The views and opinions are the responsibility of the authors and do not reflect any official Japanese position. The authors wish to acknowledge the benefits derived from discussions with Jusen Asuka, Junji Hatano, Hiroshi Isozaki, Atsushi Ishii, Shigeru Iwamoto, Hiroshi Ohtani, Shigeru Sonehara, and others.

[78] For example, the decrease in CO_2 (and total GHG emissions) decreased in 1993 and its subsequent increase in 1994 can be attributed to an unusually cool summer followed by an unusually hot and dry one. Cool summers result in less midday air-conditioning demand, thus reducing peak (fossil) generation. Dry summers mean less generation by hydro. In January 2002, the Ministry of Economy, Trade and Industry announced that Japan's energy-related CO_2 emissions for the fiscal year 2000 (April 2000–March 2001) had increased by 1.1% compared with the previous year, due to factors such as the colder-than-usual winter.

7.1.2 Energy background

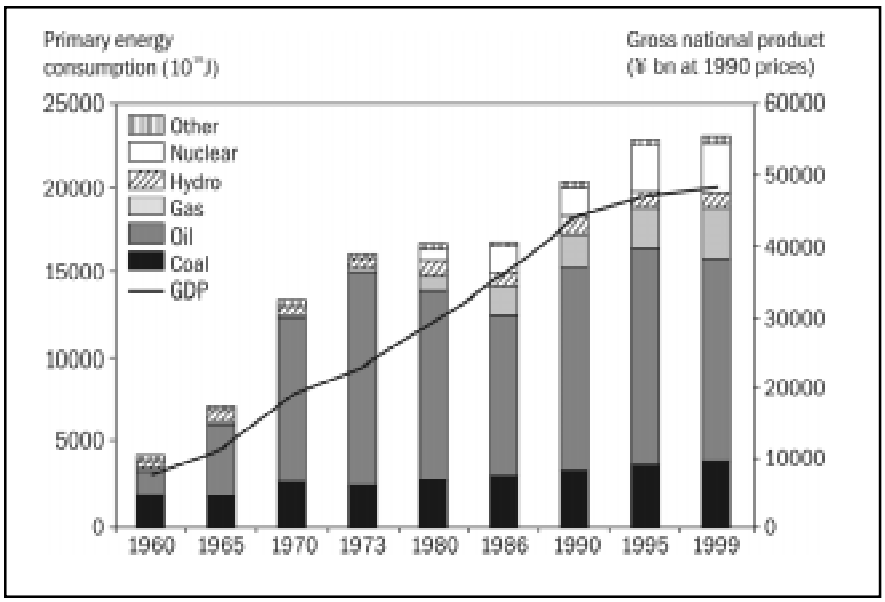
Japan's energy situation over time can be divided into the three periods: (1) pre-oil crises (until 1973), (2) post-oil crises (1973–1986), and (3) bubble economy and stagnation (1986 to present).

In the first period, a linkage between economic output and energy consumption was observed. GDP, primary energy consumption and CO_2 emissions grew at around 10% per year. Efforts on energy conservation or energy diversification did not take place.

During the two oil crises, measures on energy conservation and diversification to non-oil energy sources (coal, nuclear and renewables) were pursued, and a decoupling of economic growth and energy consumption occurred. While GDP grew at 3.5% per year, primary energy consumption grew only by 0.7% per year, and CO_2 emissions decreased slightly during this period.

The period after 1986 is characterised by two contrasting economic conditions: the period of rapid growth (1986 to 1991), followed by economic stagnation (1992 to present). Both have been characterised by the lack of improvements in energy efficiency, where the decoupling of energy and the economy has ceased to occur. Industrial energy efficiency might have even declined due to product diversification and reduced production (longer idle hours), as well as to relatively low fossil fuel prices. Residential, commercial and transportation energy demand rose at a faster pace than in many other OECD economies, due to such factors as popular preference for larger-sized goods (e.g. automobiles and electrical appliances).

Figure 7.1 Historic trend of energy consumption in Japan, according to energy source



Source: Institute of Energy Economics Japan (1960–1995), Resources and Energy Agency, Prime Minister's Office (1999).

7.1.3 Characteristic obstacles to emission reduction

Every country claims that it faces a very difficult situation in attempting to meet its GHG reduction target, and Japan is no exception. In fact, it can be said that such an argument is especially salient in the case of Japan. The reasons are as follows.

Options to reduce CO_2 are limited: high fuel prices and the severe impact of the oil crises have given rise to an energy-efficient industry. Public transport is already widespread due to dense habitation. Measures such as co-generation or insulation have less impact since Japan's climate is generally significantly warmer than that of Europe.

Energy-related measures are the only significant means of GHG reduction. Measures such as reduction of agricultural, coal-bed or landfill CH_4, or aluminium-derived PFC, which are a significant component of many countries' plans to achieve their Kyoto targets, are almost nonexistent. Even though the marginal abatement cost for CO_2 in Japan and the EU is considered to be roughly on the same scale, considerable opportunities for inexpensive non-CO_2 GHG reduction are available in the EU that are not available in Japan.

Two-thirds of the land is already covered with forest and the rest is heavily inhabited, thus leaving little potential for additional afforestation.

As a result, most energy economics models suggest that emission reduction to the numeric target of the Kyoto Protocol (down to minus 6 per cent from base year emissions) in Japan is much costlier than in other places, due to the lack of the aforementioned low cost opportunities.

7.1.4 Future energy/GHG scenario

Japan's 'blueprint' for compliance with the Kyoto Protocol (originally drafted just after COP-3 and revised in March 2002), aims to stabilise CO2 emissions through energy-related measures, and to achieve further reductions of 3.9%, 0.5% and 2.0% through sinks, non-CO_2 gases and additional activities, respectively.[79] An increase of 2.0%, mainly through HFC use, is anticipated. The remaining 1.6% is expected to be achieved from the Kyoto Mechanisms. Therefore, according to the original blueprint, Japan stands to acquire *c.*20 $MtCO_2$ through the Kyoto Mechanisms.

Energy dimensions under this blueprint are specified in the 'Energy Demand and Supply Outlook' report released by the Japanese government every few years, which presents a forecast of up to a decade or more at a time.

The previous Outlook was released in June 1998, and took into account Japan's Kyoto Protocol target. Since then, considerable changes in the energy situation have occurred. The most recent Outlook was released in July 2001 after a prolonged debate had forced the government to release two scenarios instead of one ('Base case' and 'Target case'; a third scenario which presupposes a freeze in nuclear power development was considered, but was put in the appendix since it was deemed as unrealistic).

The outcome is shown below. Both previous and present Outlooks aim to stabilise energy-related CO_2 emissions at 1990 level by 2010. Compared with the previous Outlook, however, the July 2001 Outlook shows a considerable retreat from nuclear, whose gap will need to be filled principally by coal, another baseload fuel. Furthermore, the Outlook demonstrates that considerable energy conservation also needs to take place, to account for reduced nuclear development.

It is apparent that achieving the goals specified in Table 7.2 is a tall order. The 'with measures' scenario prescribes an 11% decrease in the use of energy. The electricity sector, for example, is requested to reduce emissions by 2.4% while increasing generation by 35% (the electricity industry itself aims to limit emissions growth by 20% through improvement of CO_2 intensity by 20% while increasing its output by 50%). Some of the more difficult measures include the introduction of 2.4 million clean energy vehicles (*c.* 100 times current ownership), and lifestyle issues such as limiting voluntary air conditioning control.

[79] 'revolutionary technological development' and 'further efforts by the citizens' are factored in.

Table 7.2 TPES and CO_2 emission under the current energy demand and supply outlook

TPES (10^9l-oe)	1990	1999	2010 (present outlook)		2010 (previous outlook)		
			Base case	Target case	Nuclear freeze	Without measures	With measures
Oil	307	308	280	271	261	358	291
Coal	87	103	136	114	126	107	92
Natural Gas	53	75	82	83	83	85	80
Nuclear	49	77	93	93	70	107	107
Hydro	22	21	20	20	20	23	23
Geothermal	1	1	1	1	1	4	4
Other	7	7	10	20	19	9	19
Total	526	593	622	602	580	693	616
CO_2 (Mt-C)	287	313	307	287	327	347	287

Source: Ministry of Economics, Trade and Industry (2001). Total primary energy supply (TPES) includes non-fuel use (lubricants, naphtha for manufacturing plastics, etc.), which are excluded from calculation of CO_2 emissions. 'Other' refers mainly to renewable energy.

Thus, there is a possibility that Japan may miss the target set out in the blueprint by a considerable margin. In this case, an additional use of the Kyoto Mechanisms, perhaps in the order of 100 $MtCO_{2,}$ would be required.

7.2 Experience and problems of previous cooperation initiatives

7.2.1 Trade and investment characteristics

Trade and investment between Russia and Japan is surprisingly small, given the size, geographical proximity and potential of the two countries. Trade between Russia and Japan for the year 2000 amounted to approximately $5 billion (of which export from Russia to Japan comprised about 90%).[80] This is only 0.6% of Japan's total international trade. As for investment, cumulative foreign direct investment (FDI) from Japan to Russia up to the end of 2000 amounted to $372 million (1.2% of total FDI in Russia),[81] putting Japan as the tenth largest investor behind countries such as Sweden and Switzerland.

A notable characteristic is the complete absence of energy-related trade and investment, despite the fact that (a) natural gas and oil are the two most important exports from Russia, and (b) energy security has always been Japan's top priority. About 40% of Russian exports to Japan is metal (mainly aluminium and palladium), and another 32% is fishery products.[82] Such statistics probably understate the 'actual' investment since a large-scale multinational project, Sakhalin Oil and Gas Development Project, in which the Japanese private sector is a significant stakeholder, is not represented as Japanese FDI.

A number of reasons for this limited trade and investment have been expressed by past and potential investors. It is often noted that Japanese business confidence in the Russian market is too low to spur investment and commerce. The lack of adequate Russian financial and legal infrastructures are the most often cited reasons for perceiving Russia

[80] Data from the Japan Tariff Association.

[81] Data from Goskomstat (in Jetro 2001 (Government of Japan 2002))

[82] 1999 figure: original data from the Japan Tariff Association.

as a risky place for investment. However, risky investment conditions in Russia do not alone explain why Japan trails many other countries in organising commerce with Russia. Risk-averse behaviour of Japanese corporations due to lack of know-how in risk management, as well as continuing economic stagnation in Japan, are likely to have played a role. It has also been mentioned that large trading companies (on whom others have relied to conduct business abroad) have shied away from conducting new business in Russia due to outstanding debt issues from the transactions during Soviet era.

A recent turn of events may yet reverse this trend. The Russian economy has grown steadily since 2000, thanks to a higher oil price and devaluation of the rouble. In May 2000, the Russo–Japanese Investment Protection Agreement took effect. This provides a legal framework for investment in Russia. In May 2001, Keidanren (Japan Federation of Economic Organisations) sent a large-scale mission consisting of 250 delegates to Russia, lead by the head of the federation.

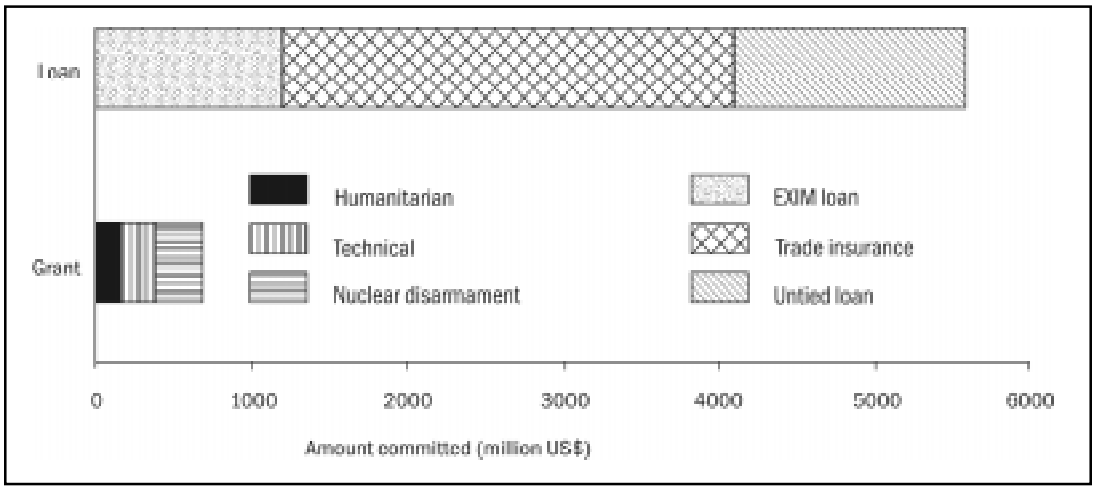
7.2.2 Economic cooperation with Russia

Russia is not recognised as one of the developing countries in need of Japan's official development assistance (ODA). Therefore, there are no projects in Russia financed by Japanese ODA. Assistance to Russia has been carried out in other forms, such as export credit and untied loans. Recently, there is a trend to diversify the countries to which ODA is directed: projects have been carried out in Poland, Hungary and Slovakia, all of which are substantially better off than Russia.

The current framework for cooperation was formulated in a series of Russo–Japanese summits in late 1997 and early 1998, between the then Russian president Boris Yeltsin and Japanese prime minister Ryutaro Hashimoto. The so-called 'Hashimoto–Yeltsin Plan' was formulated to foster cooperation in, among other areas, investment promotion and energy projects. An untied loan of $1.5 billion from the Export–Import Bank was committed (of which about $1 billion was directed towards modernisation of the coal sector). Such development of cooperation initiatives ground to a halt due to the currency crisis that hit Russia in 1998, and is currently in the process of recovery. Currently, restrictions on trade insurance are being gradually relaxed.

One issue which casts uncertainty on the Russo–Japanese relationship is the long-standing territorial dispute of the Kurile Islands, which occasionally surfaces and cause tensions between the two countries.

Figure 7.2 Japanese assistance to Russia to date



Source: Japanese Ministry of Foreign Affairs

7.2.3 Activities implemented jointly and feasibility studies

In Japan, AIJ activities have been implemented by three agencies: the Ministry of Environment (MOE), the Ministry of Economy, Trade and Industry (METI) and the Ministry of Agriculture, Forestry and Fisheries (MAFF: forestry projects). To date, a total of 21 projects have been implemented, with 13 projects obtaining host country recognition and five projects being registered under the UN FCCC secretariat. All but one project (forestry in Kenya) took place in China and Southeast Asia. This is in contrast to the considerable interest towards Russia and other EITs in funding feasibility projects for JI and the CDM.

One of the major climate-related initiatives by Japan is a series of feasibility studies in Annex I and non-Annex I countries to search for potential JI /CDM projects. From 1998 on, about 40–50 projects have been selected each year, based on proposals by the private sector, to be granted funding from the government[83] for carrying out feasibility studies (criteria for selection are not disclosed). Funding for each project is up to about ¥50 million (*c.* $400,000). The programme is in its fourth year, amounting to about 170 studies consuming an estimated total of $50 million worth of government funding. None of the projects has been actually carried out to date, even though it is said that, due to Russia's request, the Japanese government intends to implement a few of the identified projects. For more information about the Japanese feasibility studies in Russia see Chapter 5 and Appendix 4.

7.3 Japanese expectations of GIS

7.3.1 Potential merit of GIS

There is no official Japanese view on the GIS, but when presented for stakeholders, the concept has been generally welcomed, and deemed worthy of attention and further consideration. It would be safe to say that a well-institutionalised GIS could be of considerable merit to Japan. A GIS could enable Japan to reduce its compliance cost considerably by making efficient use of Russian AAUs, while ensuring that the funds for purchase are used in ways to contribute to the sustainable development of Russia. Some discussants showed an expectation that GIS as an 'early JI' would serve Japanese industry. While others argued that early transactions will emerge anyway in whatever form, this possible characteristics of GIS also drew attention.

Establishment of a GIS with Japan could certainly be beneficial for Russia. After the withdrawal of the United States from the Kyoto Protocol negotiations, Japan stands out as the largest potential buyer of allowances and credits. However, as has been discussed, Japan has shown more reluctance than others in conducting business with Russia. GIS may add the much-needed credibility to the Russian AAUs transfer.

While GIS have those potential merits, there is also a possible drawback that GIS may unnecessarily complicate IET that should serve as an effective mode of Kyoto Mechanisms. Some standard textbook analyses, e.g. static equilibrium models, indicates that the price of AAUs will become low – or approach zero – because of scant demand and a potential oversupply. However, some Japanese have a different perspective. In light of the Japanese experiences with AIJ projects in Russia and other countries,[84] this is understandable.

In their view, carbon prices under the Kyoto regime may not be cheap for some buyers, since the Kyoto mechanisms are fragile systems, where liquidity of international carbon market is highly uncertain and easily crippled by institutional and political barriers. Hence,

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[83] Through the New Energy Development Organisation (NEDO), an affiliate organisation of METI.

[84] See Section 7.2 and Chapter 5. See also Asuka-Zhang (1999) for a review of Japanese experiences with AIJ projects in China.

GIS proposals that increase transaction costs or reduce market liquidity are likely to be met with considerable opposition in Japan. However, many Japanese will welcome a GIS that could contribute to reduce transaction costs and increase the credibility of emissions trading.

7.3.2 Alternative GIS concepts

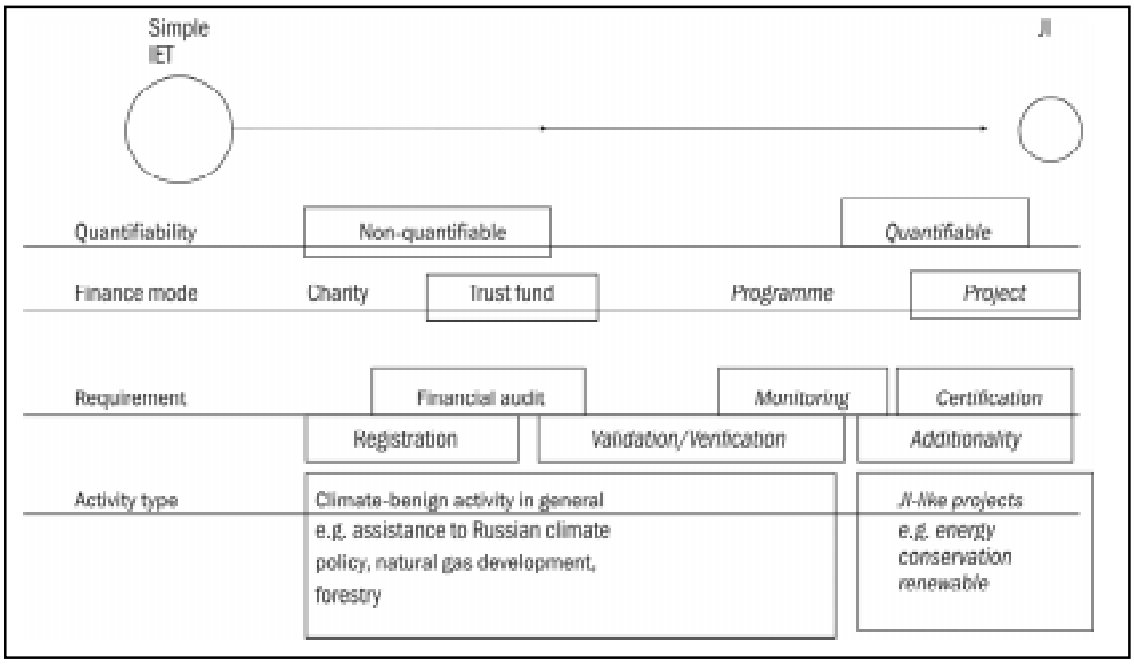
It is impressive that discussion of GIS concepts in Japan has revealed many variable elements, options and infinite patterns of their combination that had not been able to foresee beforehand.

While main part of the discussion has been already reflected in the Chapter 3, it would be also beneficial to follow the discussion in Japanese context.

The variable elements are summarised in Figure 7.3. GIS is recognised as a concept that covers a spectrum of 'added greenness' to IET, which may be quantifiable or non-quantifiable in terms of greenhouse gas emission reduction. The finance mode may be either project-based funding like JI, a programme fund or trust fund that accommodates many climate benign activities, or a charity in which part of the revenue is recycled for a climate benign purpose. Requirements for such activities could include all the elements required for the CDM or JI, i.e. registration, financial audit, validation/verification, monitoring, additionality and certification. The other extreme would be not to include any such requirements. The activity type could be JI-favoured energy conservation and renewables. Otherwise, it may include much wider activities that are climate benign but that do not easily fall within JI project categories – for example, assistance to Russian climate policy and measures, natural gas development, non-quantifiable forestry and land use projects.

There can be infinite combinations of the elements which have been identified. The discussion distilled two typical versions of them to streamline the ideas. They are denoted by boxes and italics in Figure 7.3.

Figure 7.3 Elements and combination of GIS



Note: GIS lies in between simple (unrestricted) IET and JI. Four axes, that are quantifiability, finance mode, requirement, and activity type, have been identified to characterise GIS. Among various combination of elements, two typical GIS are denoted: Quantifiable GIS and Non-quantifiable GIS. The former are denoted by italicised labels and the latter by boxes.

7.3.3 A version of quantifiable GIS

A version of quantifiable GIS is identified in straightforward manner: if we add more and more quantifiability requirements to GIS, GIS will be end up with, effectively, transformation of IET into JI. Here, the finance mode is project based, those requirements that are familiar to JI, i.e. registration, validation/verification, monitoring, additionality test and certification are mandated. Activity types are restrictive to JI-favoured projects, such as energy conservation and renewables. In this JI-like version, a clear link between buyers of credits and the projects is established. They are summarised in Figure 7.3.

At the early stage of discussion, many have expressed concern over this version of GIS. What was unclear at that time was whether GIS is going to be a mandatory scheme for *any* IET transactions with Russia or not. If GIS is mandatory to all AAU transactions *and* only this JI-like version of GIS qualifies, it means that IET disappears from Kyoto regime and only project-based options, that are less cost-effective and institutionally more complicated than simple emissions trading, remain for buyers. This is an unattractive outcome for Japan, a potential buyer.

However, the concern has been mostly removed once it was recognised that this version of GIS *cannot* be the only mode of emission trading with Russia. As discussed in Chapter 3, considering the competition with AAUs and ERUs from other parties, and CERs from developing countries, it will be Russia that suffers from mandating such a version of GIS to all IET transactions. This version, or any GIS, is likely to be a part, rather than the whole, of Russian IET. This is a satisfactory situation for Japan, since some buyers are definitely interested in buying AAUs through this GIS to secure their reputation of buying AAU with added greenness in their favour.

Those who are in favour of having this version of GIS at hand have two reasons. The first one is straight forward: the Marrakesh Accords failed to remove surplus AAUs, and hence this type of GIS is necessary to protect environmental integrity through a rigorous quantifiable approach. The second reason is more interesting. Some argued that it may be favourable not only from an ethical point of view but from a business one as well. Given the historical lack of international economic relations with Russia, this version of GIS, that looks restrictive at first sight, may earn more credit in the end by providing more credibility for AAU transactions. Moreover, if this can be co-developed with the EU in a trilateral manner, Japanese participants may benefit from securing internationally authorised, hence politically stable, AAUs.

7.3.4 A version of non-quantifiable GIS

The opposite end of the GIS spectrum, a version of non-quantifiable GIS, is denoted in Figure 7.3 by boxed elements. Here, the financial mode is not necessarily project based, but could also be either a trust fund or charity. For revenue recycling activities, there may be requirements such as financial audit and registration, but JI-like concepts such as validation/verification, monitoring, additionality test and certification are absent. The activity types are not necessarily JI-like projects. A much wider range of climate-benign activities is targeted. Note that there is no direct link between the buyer of credits and the activities themselves, which will be financed by the sale of those credits. This GIS is somewhat analogous to the popular concept of 'eco-fund' or 'socially responsible investment (SRI)'.

There has been strong support to have non-quantifiable GIS as an option. There are three reasons for this. First, the priority climate policy area for Russia is often addressed through non-quantifiable measures. They include, capacity building, greenhouse gas inventory preparation, non-quantifiable forestry projects, etc. Being quantifiable is not

the only measure of being environmentally benign. Investments should not favour quantifiable projects but should encompass non-quantifiable or less quantifiable activities. Second, the primary concern from Japanese buyers is not quantifiability, but good governance that the revenue is not misused or wasted. Quantifiability does not necessarily equate to good governance, as was identified in Chapter 5. The third reason is cost effectiveness. To maximise the environmental benefit accruing from the revenue recycling, we want to minimise transaction costs. However simplified the procedure may be, quantifiability is likely to incur transaction costs. If we know we are spending the money for sound environmental purposes with good governance, then there will be no need to further complicate the process by asking for quantifiability.

Non-quantifiable GIS may give greater freedom of investment choice and reduced oversight as compared to quantifiable GIS. Indeed, it may be that other attributes are more critical in the Japanese context than the distinction between quantifiable and non-quantifiable per se.

7.3.5 A wide variety of GIS options

There has been a broad consensus, especially from the business side, that developing a variety of GIS options will be beneficial. What is sought here is not a mandatory GIS as the only legal framework to access AAUs, but many versions of GIS that accommodate a wide range of buyers' preferences. Some buyers will want to buy AAUs from JI-like GIS projects for their own reputation. Other buyers may prefer to buy AAUs that are less quantifiable but environmentally credible and well governed

GIS is seen as a bottom-up and voluntary process based on decentralised decision-making, which is an option for private buyers of AAUs. Those buyers who want AAUs with 'added greenness', have an option to obtain them.

In practice, no business will want AAUs that are either financially or environmentally dubious. Instead, they will prefer a GIS that ensures that funds are well governed and used for credible purposes. Hence, also under a voluntary regime, they are likely to develop an approach which ensures that funds are used for the designated purposes.

Many commentators in Japan, however, question the need for or appropriateness of a regulated, government-mandated scheme. In part, this reflects the far closer integration of government and business activities in Japan, which is quite distinct from the formal Anglo-Saxon separation of powers between government and business. From this perspective, if a national consensus emerges that emissions trading should be associated with 'green' use of the revenues, this will be sufficient to ensure Japanese businesses act accordingly. Even in Japan, however, environmental groups would question whether this is acceptable.

7.3.6 A different view on 'Excess AAUs' in Russia

A different view on 'excess AAUs' in Russia has been identified as an interesting by-product of the discussion on GIS.

At the beginning of the discussion, GIS was considered as a way to address the concern about surplus Russian AAUs by connecting its revenue to quantifiable projects. However, the discussion has revealed less importance attached to this aspect, compared to the need to address aspects such as good governance and non-quantifiable activities.

The 'surplus AAUs' issue is getting less relevant as the carbon market is becoming better understood. At the early stage of analysis, it was believed that the carbon price could fall to zero in the absence of GIS. It was also believed that Russia might have monopolistic power over the carbon market. We began with the assumption that both were probable, but it turned out that neither is likely. The carbon price may not fall to zero since Russian AAUs are in competition with AAUs and ERUs from other parties, the CDM and the banking of allowances and credits for use in the second commitment period. Moreover, if the price is extremely low, there may be many buyers who wish to buy them and bank for the second commitment period. Due to this competition, Russia is less likely to be able to exert monopolistic power, and more likely to remain a price-taker from international market.

If Russia is a price-taker it will attempt to minimise transaction costs, since these costs will simply reduce profits. A JI-like version of GIS is not favourable in this case, and either quantifiable GIS with lower requirements than JI, or non-quantifiable GIS, will be more preferable to Russia.

7.3.7 Bilateral or trilateral?

Many discussants have argued that a Russian–Japanese GIS need not be integrated with a Russian–EU GIS, if the concepts differ. An EU–Russia GIS may be a 'Quantifiable GIS' and highly controlled by government. A Russian–Japanese GIS may be a 'Non-quantifiable GIS', without governmental intervention, market-oriented and based on decentralised decision-making.

Others have argued that trilateral cooperation (at least in the development stage) is desirable from a Japanese business sector viewpoint, if it can utilise EU experience and ties with Russia. It is likely that there will be some business participants who will be interested in joining such a trilateral scheme.

GIS may be a bilateral agreement between buyers and sellers. Most likely, both schemes will co-exist. If 'diversified greenness' is accepted as the way forward, it may be possible and beneficial to have governmental discussion at a trilateral level.

7.3.8 Simple IET is also an integral part of the answer to maintaining environmental integrity

An opinion common to all of the stakeholders is that maintaining environmental integrity is not a secondary concern for Japan, either ethically or from a business perspective. At this stage, however, the opinions are divided as to which institutional arrangement will best contribute to that goal.

Some have argued for JI-like GIS. Others have argued for non-quantifiable GIS. The latter includes those who support simple IET as an important vehicle. They argue that AAUs obtained from the IET market based on Article 17 have their own legitimacy, hence they do not necessarily have to be additionally 'green'. They argue that the Marrakesh Accords have clearly ruled that free AAU trade is of the utmost importance in protecting the global climate and that reinterpretation is not necessary. Purchasing a unit of AAU automatically means a unit of emission reduction elsewhere, be it in the first commitment period or the second commitment period through less banking.

7.4 Concluding remarks

There is a broad consensus that having a variety of GIS options is beneficial. Buyers should have the freedom to choose the level of quantifiability that they believe is appropriate. They should also be allowed to attach their own priorities to 'greenness'. Good governance is likely to be valued by all buyers more highly than other criteria. Simple emission trading, or a version of GIS close to it, will remain as an important vehicle in Kyoto regime.

8 Canadian expectations of GIS[85]

John Drexhage

8.1 Canada and the Kyoto Protocol

In December 1997, Canada came on board with some 150 other nations and agreed to the Kyoto Protocol. Under the Protocol, Canada agreed to reduce its GHG emissions 6% from 1990 levels by the years 2008–2012.[86] Canada agreed to such a relatively stringent target for two reasons: the Protocol included a number of 'flexibility' measures (six greenhouse gases, emissions trading, the CDM, JI, budget period of five years, banking and sinks) that, theoretically at least, should work to significantly reduce the overall costs of meeting its Kyoto target. The second reason lay in the fact that the United States was also part of the bargain – it agreed to a reduction of 7% – and since the economies were so integrated (87% of Canada's exports are to the United States) and becoming even more so year by year, it was felt that Canada could meet a target similar to that of the US, since efforts to reach those targets would be roughly commensurate between the two nations. As part of that effort, both countries were, from the start, interested in exploring how many surplus emissions units could be purchased from Russia, and others, to offset the cost of directly reducing emissions at home.

Of course, since December 1997, a number of important developments have taken place to change the international equation on climate change. Probably most importantly, the United States, under the Bush administration, decided to withdraw its support for the Kyoto Protocol. Claiming that it was 'fatally flawed', since it did not have developing countries with their own GHG mitigation targets, the US administration has made it clear that it does not intend to change its mind on this issue. With the US out of the Kyoto Protocol, the viability of an international emissions trading system has come under threat. With the biggest customer no longer available, the potential total value of Russian surplus units was perceived to have fallen sharply, even though some countries, in particular Japan and Canada, still see a need to buy Russian units to help meet part of their commitments.

With the US out of the negotiations, Russia and Japan enjoyed considerable leverage in the negotiations since their ratification was required for the Kyoto Protocol to come into force. The result was more than a little ironic. While the US is not a part of Kyoto, the agreement itself reflects a strong American influence, such as in the areas of flexible Kyoto Mechanisms and generous sinks allowances for a number of Annex 1 parties. Getting essentially everything they wanted at Bonn and Marrakesh, the Russian, Japanese, Australian and Canadian governments returned to their capitals to pursue their respective national ratification processes.

In the case of Canada, the prime minister has stated on a number of occasions that it is Canada's goal to ratify the Protocol, but no firm timeline for ratification has been

[85] Views were drawn from the federal and provincial governments, business communities, provincial governments, municipalities and non-government organisations by interview. However, the views expressed here only represent author's reflections on their comments.

[86] The Kyoto Protocol to the Convention on Climate Change, table, p. 33.

elaborated. The reactions from domestic constituencies is decidedly mixed. Alberta and two major industrial trade associations have expressed very strongly opposition to ratification. They regard it either as a wealth transfer from Alberta to the central government, or a piece of legislation intended to stem economic growth in Canada's manufacturing sectors. Among other provinces and territories, only Quebec, Manitoba and the three Arctic territories are strongly supportive of ratification, while others are conditionally supportive or have significant concerns. In addition, there are strong concerns that Canada's competitiveness, particularly vis-à-vis the United States, could be at risk should Canada agree to reduce its GHG emissions 6% from 1990 levels while the US continues to expands its emission base by some 30%.

8.2 Canada's emissions scenario for the Kyoto commitment period

In 1990, Canadian GHG emissions totalled approximately 607 $MtCO_2e$. As a result, the Canadian target for the 2008–2012 period (referred to as the First Commitment Period of the Kyoto Protocol) is 94% of that figure, or 571 $MtCO_2e$.

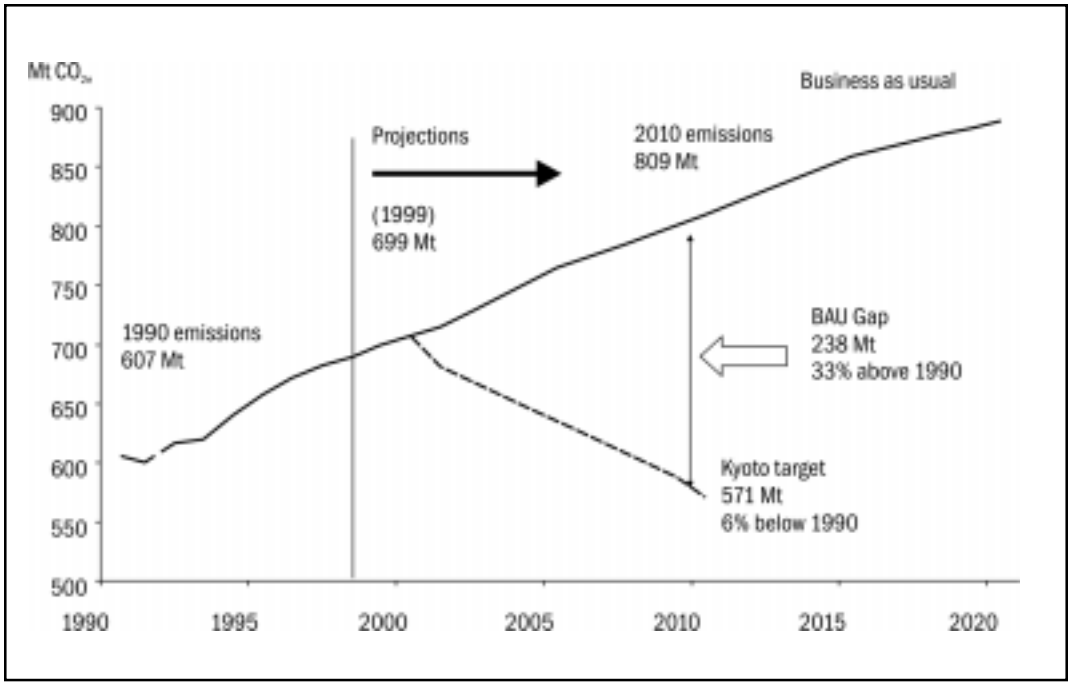
In order to get an idea of the size of the challenge that Canada faces in implementing the Kyoto Protocol, it is important to know not only what target it is aiming for, but what the likely emissions level would be if it was not to undertake policies that would achieve its Kyoto target. This latter scenario is often referred to as the Business as Usual (BAU) scenario, and the difference between the Kyoto target level and the BAU level in 2008-2012 is referred to as 'the Gap'. It is important to note that the BAU scenario does *not* include publicly funded actions on climate change, such as federal or provincial programmes announced under the First National Business Plan, or the sinks allocations agreed to at Marrakesh, as these represent measures that only exist because of Kyoto and so would likely not have occurred in a BAU scenario.

As one might imagine, the size of the Gap is based on a number of assumptions on which only educated guesses can be made. They include the likely rate of economic growth between now and 2008–2012, and which major development projects with significant energy implications should be included in the BAU scenario. All that said, recently revised figures on the size of the Gap indicate that under a BAU scenario, Canada's emissions of greenhouse gases would reach approximately 809 $MtCO_2e$ in 2010. This represents a 238 $MtCO_2e$ 'Gap' between this scenario and Canada's commitment under the Kyoto Protocol and a 39 $MtCO_2e$ increase in the estimated 'Gap' since the previous estimate, released in December 1999.[87]

The estimate of the size of the Gap is relatively sensitive to economic growth assumptions; for example, an assumed 1% increase in annual economic growth over the decade between 2000–2010 translates to an increase in 2010 emissions of roughly 35–40 $MtCO_2e$. The Gap may also change in response to changes in a number of other factors; for instance, changes in the price of oil, or in the price of natural gas.

[87] Information on the GHG emissions gap in Canada was found in *The Size of Challenge*, a Government of Canada Backgrounder, 22 March 2002.

Figure 8.1 Canada's projected GHG emissions



Source: Environment Canada

Governments have been making regular revisions to estimates of the size of the Gap, usually on a project basis. For major projects, there must be a reasonable expectation that these projects will be on stream by 2012. For example, plans for further expansion of oil sands mining development in Alberta is now estimated to result in an increase in Canada's Gap of 7.1 $MtCO_2e$ from the last update.

8.3 Canadian efforts to close the gap

The federal government, hopefully in conjunction with provincial jurisdictions, is working on developing a plan for how it will be able to close the 238 $MtCO_2e$ gap. While there are no estimates yet for the impact of provincial actions, the federal government has estimated that Action Plan 2000, the budget of 2001 and the sinks deal at Bonn and Marrakesh would close by the gap by around 100 $MtCO_2e$, leaving Canada with a gap of an additional 138 $MtCO_2e$.

On 15 May 2002, the federal government released 'A Discussion Paper on Canada's Contribution to Addressing Climate Change'.[88] After setting the context of why Canada needs to address climate change seriously, the paper goes on to submit four options on how Canada could meet its Kyoto commitments. After consultations across Canada, the government will focus on developing one option over the summer and make a final determination on ratifying Kyoto sometime later in the year, likely by or after COP-8 in October.

There are a number of elements arising out of the Discussion Paper that are worth noting. First of all, it appears that the costs of meeting Kyoto will not be prohibitive, one of the primary reasons being an explicit reliance on the using the Kyoto Mechanisms. In

[88] A Discussion Paper on Canada's Contribution to Climate Change, Spring 2002.

some cases, more than 50% of the reductions would be met through international emissions trading. Nonetheless, the government still has strong concerns about the impacts of ratifying Kyoto without the US on board. As a result, the government is seeking to have 70 megatonnes exempted from their Kyoto target, based on clean energy exports in the form of natural gas and hydro to the United States. Finally, the Options Paper does spend some attention on the issue of purchasing credits from countries such as Russia. The government's view on this issue will be elaborated in the section addressing Canadian views on the Green Investment Scheme with Russia.

The next piece of national business was a meeting of provincial and federal ministers on 21 May 2002, who discussed the best way of going forward in addressing Canada's response to climate change. The federal government, with the support of nine provinces and the territories, agreed that a set of consultations should be launched in 14 cities across Canada over June, specifically addressing the question of whether and how Canada should ratify the Kyoto Protocol. Alberta has formally notified the other governments that it is not interested in addressing climate change in the context of Kyoto, and instead proposed a 'made in Canada' alternative. It proposes that the target should be of a limited intensity scale (50% reduction in emissions intensity for Albertans use of fossil fuels; no targets for fossil fuels exported to other areas of Canada or internationally), extended over a longer time period (until 2020).

While the specific details of how Canada might ratify the Kyoto Protocol are still being sorted out, its main components have become clearer over the last few months. The plan would be shaped by the following considerations: cost-effectiveness; regional and sectoral impacts; domestic reductions versus purchase of international credits; and co-benefits, particularly those associated with health and the environment.

Shaped by these considerations, Environment Minister Anderson has proposed a three-pronged approach to the plan to close Canada's gap.[89] One significant component would be a domestic emissions trading programme, which would likely include a cap and trade system for Large Final Emitters (LFEs). Although one of the options proposed in the Discussion Paper does a 'Broad as Practical' approach, which would cover 80% of Canada's emissions, including its transportations sector, LFEs would typically cover large industrial operations, utilities, oil sands operations and petroleum refineries. It has been informally estimated by the Domestic Emissions Trading Working Group that this would cover *c.*35% of Canada's projected emissions. Under domestic emissions trading, companies would be free to make internal reductions, or purchase emission reduction units from other domestic/international sources in the form of credit and/or allowance-based emission units.

The second part of the plan would cover targeted policies and measures for those sectors outside the mandatory cap and trade system. The major sectors covered under this section would include transportation, forestry and agriculture. Although no hard estimates currently exist as to how many reductions could be obtained from this area, it is likely that efforts would be focused on those policies and measures that provide health and environmental benefits, as well as investments that enhance employment and/or competitiveness of Canadian industries. Finally, there may be other policy goals, such as enhancing urban transit that would be promoted for a number of policy-related reasons.

Finally, Minister Anderson has indicated that the federal government is likely to invest in international credits that might be necessary to close whatever is left of the gap after the influence of an emissions trading system for LFEs and policies and measures programme has been established. Whether this would serve as a 'backstop', or an integral

[89] See Notes for An Address by the Honourable David Anderson, PC, MP, On the Occasion of the Annual Awards of the Voluntary Challenge Registry.

part of the national plan, has yet to be determined, but it is clear from the design of the options that the most cost-effective ones would be those that incorporate international credits as an integral part of the plan. Regardless, it is clear that part of such an international credits scheme would almost clearly involve Russian and/or Ukrainian surplus units which have raised concerns on the environmental integrity of the Kyoto Protocol.

8.4 Canadian stakeholders views on a green investment scheme with Russia

While the list of those interviewed is by no means exhaustive, it is noteworthy that there is a surprisingly strong degree of consensus among all groups on this issue – everybody expressed real concerns about an unqualified emissions trading regime with Russia. There were concerns expressed about the overall environmental integrity of such transactions (no real reductions will have taken place) and the fact that, to all appearances, it seems little more than a simple transfer of wealth, for no apparent good other than to the purses of the Russian treasury.

In that respect, the proposal for a Green Investment Scheme was regarded as a positive development that would enhance the overall credibility of emissions trading/joint implementation internationally. As a general comment, the primary concern with such an initiative was whether it could be realistically implemented in a timely manner that would take advantage of emission trading opportunities prior to 2008. As Chapter 5 indicates, there are a number of significant barriers, in the areas of institutional readiness, implementation and funding, that must be attended to before any such 'scheme' can be legitimately launched.

One of the concerns most specifically mentioned was monitoring and verifying of revenues accruing from GIS transactions. The legitimacy of Russian sensitivities to a stringent verification regime was understood but in their view, ensuring that real reductions actually transpired should be given equal weight. One possible novel approach would be to offer services from Canadian industry expertise instead. For example, in exchange for AAUs, Canada could offer services, technology and capacity building in the form of, for example, energy conservation and efficiency. An area where Canada offers leading world expertise is in the field of natural gas transmission. Such a scheme would also see a share of the revenues then going back to those Canadian companies providing such services in Russia.

There was general sympathy among stakeholders for the view that JI-type or quantifiable project specific activities would be far preferable to more non-quantifiable activities. In other words, funding received through the sales of surplus units should be recycled in discrete activities that have made a transparent and convincing case for how environmental additionality will be achieved through such an investment. Having such a project-specific regime in place would probably be no different from the CDM regime currently being developed for the pre Kyoto commitment period. There was a perception of a need for parallel regimes encompassing these two types of international climate change investments. Concerns were expressed that non-quantifiable activities would be too general to be environmentally credible.

While there were no specific preferences for the type of agreement reached (unilateral, bilateral, or other), most felt that the bilateral format probably made the most sense. As it would be difficult to align Japanese, European and Canadian sensitivities and/or priorities, it would probably be easier to develop discrete bilateral agreements. As far as a unilateral initiative was concerned, it was felt that, while this was theoretically fine, the Russian government would need to be sure that all such arrangements made a transparent and credible case for how additionality was achieved under such an arrangement.

With respect to scope, the view of the majority of those Canadian stakeholders interviewed (with the exception of a few environmental non-governmental organisations) was that GIS should not necessarily be limited to energy efficiency and conservation. In principle, sinks (both agriculture and forestry) should be included in a list of legitimate GIS activities, as should renewable energy projects and measures such as methane capture from landfill sites. What is critical is clear and credible reporting, but so long as those criteria are met, then the scope of activities under GIS should not necessarily be limited.

Although the clear majority strongly preferred that GIS funds should only be recycled towards quantifiable projects that would result in real reductions, some were open to exploring other avenues. For example, what about non-quantifiable activities such as helping Russia develop its inventory reporting and monitoring capacity? Or what of investments in public education and outreach where it may be difficult to make a clear case for how such initiatives may actually work to reduce emissions? It was felt that quantifiable project investments could possibly find funding from other sources, such as the World Bank or the EBRD.

8.5 The Canadian Government's view

In its Discussion Paper, it is clear that the federal government has taken these considerations into account. Should the federal government decide to purchase emission permits on the international market, it would be guided by a number of principles, including the following: 'Canada may need to consider the purchase of surplus carbon permits from other countries and how those surplus permits could be made environmentally friendly or "greened"'. It defines 'greened' surplus allowances as permits whose revenues are used by the country selling then on new emission reduction projects.[90]

In other discussions, federal officials have informally stated that purchasing emission credits and allowances would be based on three criteria: the transactions should be relatively inexpensive, legitimate and environmentally credible. The framework of investments and reporting of how recipient countries are using revenues accruing from the sale of surplus allowances needs to be defined. Those investments must be credible, subject to auditing/accounting review, publicly accessible and should represent a real contribution to the global effort to mitigate climate change.

8.6 Conclusion

In summary, the majority view of stakeholders in Canada is that GIS is certainly preferable to an unqualified emissions trading regime, but that quantifiable project-specific investments, as opposed to funding of non-quantifiable activities, are a much more preferable form of investment. In that respect, the view of Canadian stakeholders is more similar to that of Europe. However, Canadians are perhaps more open to widening the scope of GIS investments to include reductions activities beyond energy conservation, such as agricultural and forestry sinks. Monitoring and verification of GIS investments is another top concern – one proposed solution is to offer services in the areas of technology and capacity building.

It appears that the Canadian government has taken on board these considerations. It has formally indicated that it will be exploring ways to 'green' surplus allowances, and is

[90] A Discussion Paper on Canada's Approach to Climate Change, Spring 2002, p. 19.

sensitive to concerns that international AAU purchases should not be understood as simple wealth transfers. In that respect, there may be a strong interest in developing an agreement with Russia that provides for Canadian companies to provide services for Russia in helping them reduce their greenhouse gas emissions in exchange for Canadian purchases of Russian surplus emission allowances. While it is too early to be definite about the areas where investments will most likely take place in Russia, Canada's experience in natural gas points to an area of potential collaboration.

9 Conclusion

By Authors

9.1 GIS concept

The adoption of the Marrakesh Accords and moves towards bringing the Kyoto Protocol into force represent an important transition from global negotiation of the basic commitments and rules for action on climate change towards more focused efforts on effective implementation. The Russian 'Green Investment Scheme' proposal to use revenues from emissions trading for environmentally related investments is one of the most far-reaching international implementation initiatives.

There are several reasons for mutual interest in the GIS approach. From the Russian side, the GIS represents a way to:

- help the development of a stable and predictable market for emission allowances in the face of large uncertainties (for example, concerning supply–demand balances in the aftermath of US withdrawal);
- help channel and manage revenue flows to improve the efficiency of key sectors of the Russian economy;
- attract and leverage meaningful foreign investment and, potentially, provide a platform and rationale for associated technology investment and transfer;
- increase the attractiveness to foreign purchasers of Russian Assigned Amount Units.

Such incentives could equally apply to other major potential AAU exporters such as Ukraine.

For the potential governmental buyers, the incentives are similarly to:

- avoid a price collapse that would shatter the complex balance achieved in the Kyoto negotiations;
- address domestic political opposition to international financial transfers, by demonstrating real international and domestic benefits associated with the investments made;
- maintain the legitimacy of emissions trading as an environmental instrument rather than a simple cash transfer;
- potentially provide a legislative and procedural framework to reduce investor risks, by improving the transparency, effectiveness and financial viability of international investment in the Russian energy sector (and potentially others).

Our study has identified many complexities and choices that must be addressed, however, and also a need to further clarify important elements of any proposed GIS.

9.1.1 Definition of a GIS

The concept of a GIS refers to ways of using revenues generated from trading AAUs, under Article 17 of the Kyoto Protocol, for environmentally related purposes. In principle, therefore, GIS may finance a range of activities from capacity building in respect of developing appropriate statistical collection and reporting methods, to large-scale emission reduction projects, e.g. conversion of large electricity utilities from coal to gas-firing.

The task of this research project has been to show how a GIS may be interpreted by different parties and how it could be implemented.

The various potential buyers of AAUs under a GIS have different priorities and preferences. However, the majority of potential buyers would prefer that:

- Russian revenues from sale of surplus AAUs are earmarked for societal or environmental purposes;
- The revenues are subject to governance criteria which ensure that funds are not misused or wasted.

Within these broad principles, differences of view between major potential buyers – the EU, Canada and Japan – may mean that a single multilateral agreement will be difficult to negotiate. If that proves to be the case, a GIS can operate as a framework for bilateral agreements between Russian and national governments. These bilateral agreements might vary considerably in terms of both the scope of activities considered appropriate for funding, and the strictness of the application of criteria such as: verification, additionality and monitoring.

9.1.2 GIS and JI

There is a clear legal distinction between GIS and JI. Efforts to use JI procedures to 'funnel' AAUs (with volumes defined by project emission savings before 2008), is then by definition part of the concept of GIS. In terms of discrete projects, the key distinction is that, whilst JI is bound by criteria of additional emission reductions in the first commitment period 2008-12, GIS need not operate under these specific constraints. Early reductions (before 2008) could be credited and transferred to investors as a forward trade of AAUs. However, the differences are much more far-reaching:

- GIS is based on the income from sale of surplus AAUs, whereas JI involves the transfer of ERUs actually obtained from the implementation of a project. In effect, this means that from the start a GIS will have a source of finance; this would improve the economic attractiveness of projects and help to promote early investment;
- Exchanges are not necessarily restricted to discrete projects denominated in terms of additional emission savings, but in principle allow far greater freedom of investments. For example, a 'programme approach' GIS (see Chapter 3) can apply simplified verification procedures, particularly if the projects are of a type where emission reductions are easy to quantify.
- Governance by the globally-agreed restrictions and procedures associated with JI can be replaced by wider bilateral or multilateral understandings and procedures.

In effect, GIS (operating under Article 17) places greater onus upon the specific participating countries to ensure legitimate and effective use of international transfers, rather than relying upon the safeguards built into UN architecture and procedures for project verification. This offers the potential, amongst other things, for much lower 'transaction costs', but with a different risk profile than (track two) JI projects: notably, GIS transfers are worthless until Russia does ultimately fulfil the aggregate protocol requirements in terms of emissions inventory and reporting. In all these respects, GIS transfers place greater onus upon governance within the exporting countries.

9.2 GIS design and governance

As noted above, GIS can be structured as a multilateral agreement or several bilateral agreements which would allow different interpretations of the degree of 'greenness', and

the governance rules applying to activities under the scheme. In practice, Japan, the EU and Canada are likely to have different preferences on issues such as: use of revenues, verification and additionality (see below). This difference in preferences suggests that bilateral agreements are more likely to be successfully and rapidly concluded than a multilateral agreement.

Green investments can be organised in two main ways: (a) a scheme with no link between the buyer of Russian AAUs and the actual use of the income in Russia – i.e. the income is used for financing projects designated and implemented independently of those involved in the AAU transaction; and (b) a scheme where the buyer is involved in carrying out a project in Russia.

Corresponding to this distinction, there are likely to be two important elements of a GIS.

- A framework agreement between governments: a Memorandum of Understanding (or similar document) to serve as a general agreement recognising GIS as an instrument. This could be accompanied by agreement on a guaranteed initial volume and price of AAUs (for example, an initial 33 $MtCO_2e$ at a fixed price), which will be sold when Russia fulfils the international criteria on reporting and inventories to allow exchange of AAUs under Article 17. If this type of agreement can be reached, the Russian government will authorise appropriate ministries and other organisations to develop an appropriate framework for implementing project activities.
- Project definition by companies: development of project-based activities at the company level with a request to governments to confirm these activities within the framework of a GIS and to guarantee AAUs transaction to cover project investments at least partly (when Russia fulfils the criteria for AAU exchange).

In practice, the scope and design of GIS will be affected by the preferences of potential importers.

9.3 The importers/investing countries

9.3.1 EU

The European Union has a two-fold interest in a GIS: as a means of enhancing its relations with Russia, particularly with regard to energy, and as a way of utilising and managing the Kyoto Protocol's flexible mechanisms.

During the UN FCCC negotiations, the EU has consistently placed much emphasis on 'environmental integrity' and tried hard to limit the extent to which countries could rely on International Emissions Trading to meet their Kyoto targets. The EU is unlikely to purchase Russian AAUs without some assurances as to the environmental integrity of those trades.

The emphasis in the EU's climate-change policy towards domestic policies and measures to abate GHG emissions, and associated emission projections, suggests that EU demand for external credits will be weak, and the central and eastern European countries that are about to accede to the European Union will provide a source of surplus AAUs potentially rivalling that of Russia.

The proposed EU-wide emissions trading system is internally-focused, though it obviously does not preclude EU governments from purchasing AAUs externally. In addition, even if the domestic EU emissions-trading scheme remains closed to external credits, it covers just one sector – fixed-point industrial emitters – and represents less than half of the entire EU abatement effort. A GIS that offers additional potential for

project investment, especially in the very important Russian energy sector, could be of vital economic interest for the European Union.

There is likely to be strong interest in the European Union for a GIS for a number of reasons:

- a general interest in the design of such an important mechanism in the Kyoto Protocol that 'legitimises' IET, and which offers great cost saving potential in meeting the Kyoto targets.
- potential to apply the principles of a GIS to the surplus emissions reduction credits of the central and eastern European countries.
- a GIS could complement the EU–Russian Energy Dialogue contributing to the reliability and growth in the energy trade, modernisation of the Russian energy sector and reduction of greenhouse gas emissions;
- a well-designed GIS would generate demand within the EU for AAUs providing lower-cost abatement opportunities.

The EU is likely to favour a GIS that allows additional investment in projects in the former Soviet Union. Indeed, individual EU member states – particularly the Netherlands, Sweden and Germany – have either begun pilot JI-style projects or have expressed an interest in so doing. The GIS could complement these initiatives.

9.3.2 Japan

Japanese actors, as potential buyers of Russian AAUs, have a preference that the revenues from sales of AAUs are well-governed, so that funds are not misused or wasted. There is also a preference that the revenues from AAU sales are used for societal or environmental purposes. However, there are major differences between potential buyers regarding the details of verification criteria. Some want a project approach similar to JI with strict monitoring and additionality requirements. Others do not see any need to incorporate concepts that may complicate a GIS and waste revenues that should be used only for the designated purposes.

9.3.3 Canada

The majority view of stakeholders in Canada is that the GIS is certainly preferable to an unqualified emissions trading regime, but that project-specific investments, as opposed to programme-wide funding, are a much more preferable form of investment. In that respect, the Canadian position is more similar to that of the EU; however Canadians are perhaps more open to widening the scope of GIS investments to include emission reduction activities beyond energy conservation, such as agricultural and forestry sinks. Monitoring and verification of GIS investments is another top concern – one proposed solution is to offer services in the areas of technology and capacity building.

The Canadian government has taken on board these considerations and has formally indicated that it will be exploring ways to 'green' surplus allowances. It is sensitive to concern that international AAU purchases should not be legitimised as simple wealth transfers. In addition, there is a clear emerging interest in the possibility of large-scale Canadian AAU purchases being linked to projects that involve Canadian companies or expertise, thereby bringing some of the revenue ultimately back to Canada so as to mollify domestic opposition to wealth transfers.

9.4 Obstacles to GIS

9.4.1 Institutional obstacles

The main institutional obstacle in Russia has been the absence of an authorised authority to guarantee transfer of AAUs and/or ERUs under the Kyoto Protocol regime. This problem should be solved during preparations for, or after ratification of, the Kyoto Protocol by the Russian Federation. Given the decision of the Russian Government of 11 April 2002 to increase coordination of climate change activities, the most obvious solution would be to include those functions in the responsibilities of a new governmental coordinating body which would replace (or would evolve from) the existing Interagency Commission of the Russian Federation on Climate Change Problems.

9.4.2 Eligibility

As long as Russia is not eligible for emissions trading, it cannot sell and transfer AAUs to other countries. To become eligible for emissions trading, the Kyoto Protocol will first have to be ratified by Russia and enter into force. Secondly, Russia has to calculate its assigned amount units and have this approved in an expert review by the UN FCCC. To do that it must also establish a registry and report its emissions in a manner that is acceptable to international review teams. Relatively poor statistics, and massive shortcomings in earlier Russian national reporting, indicate that Russia has a lot of ground to cover before it can meet international reporting requirements. Until Russia becomes eligible, it might sell AAUs on a forward basis. To be considered attractive, such forward-contracts will probably have to be sold at a substantial discount, compared to a situation where Russia is eligible for emissions trading. The current lack of funding for reporting activities, and other eligibility requirements, represents one of the largest obstacles to Russian participation in emissions trading, and hence to creating a GIS.

9.4.3 General investment problems

Some general features of the current Russian investment climate are not conducive to 'climate friendly' energy efficiency investments:

- low energy prices;
- rapidly changing legal and fiscal frameworks;
- poor adherence to contracts.

In addition, there are some institutional problems which constitute major obstacles to foreign investments within the Kyoto framework, for example:

- failure of previous efforts to sign government to government agreements for existing programmes, such as the Prototype Carbon Fund and ERUPT, for various reasons (e.g. absence of decision on ratification of the Kyoto Protocol; lack of ministerial consensus);
- some project proposals by Russian companies and institutions, especially in energy sector, have not been authorised by the Russian government as activities under the Kyoto Protocol regime;
- other countries (the EU, Japan and Canada) are planning their domestic policies under the Kyoto Protocol and are not yet ready to negotiate practical issues of international emissions trading;

- foreign companies which are potential buyers of AAUs and participants in JI project activities, do not yet have incentives to participate in a GIS, because links between domestic and international emissions trading systems are not yet established.

9.5 Where from here?

9.5.1 Which projects are most likely to be prioritised under bilateral agreements?

Russia: Projects in the energy sector are the first priority: energy efficiency improvements, renewable energy and bio-fuels. In 2001, the Russian Government approved two new federally targeted programmes: 'Energy Efficient Economy', for which the Ministry of Energy has responsibility, and 'Russia's South', for which the Ministry of Economic Development and Trade is responsible. A portfolio of energy projects is likely to be developed under these programmes.

A more limited number of project opportunities exist in other sectors such as forestry, industrial processes (e.g. aluminium and cement production), pulp and paper production and landfill methane. Land-use projects development are problematic at this initial stage.

The European Union: Insofar as it is possible to speak of the EU as a unitary actor, it is expected to show a general preference for an environmentally credible GIS that leads to real and verifiable emission reductions. The supranational institutions of the EU, particularly the European Commission, are already involved in technical assistance to the economies in transition (through the PHARE and TACIS programmes), and as such can be expected to support measures such as capacity building that fall under the definition of a programme-approach GIS. Individual member states might take varying approaches to the GIS, with some in favour of a project-based GIS in which the private sector can participate. There is no reason why the two approaches could not coexist.

Japan: There is a wide spectrum of Japanese potential buyers who may be interested in activities under GIS. Numerous feasibility studies of greenhouse gas reduction projects in Russia, including those conducted by NEDO, are candidates for a GIS. Capacity building such as research activities, creation of emission inventories and a registry would also be good candidates for initial projects. They could pave the way for broader GIS activities such as energy engineering services and forest management.

Canada: Like the EU, Canada is currently expressing most interest in a project-oriented GIS. However, it is likely to be interested in a broader scope of projects than the EU. Canadian exploration of linking GIS investments to the involvement of Canadian firms may tend to promote projects in which Canada can offer particular expertise, which suggests that projects in natural gas pipelines, forestry, and perhaps biomass energy may be particularly significant.

9.5.2 Funding for GIS

Funding opportunities for GIS-projects exist today. The two most obvious candidates are the World Bank Prototype Carbon Fund (PCF) and the Dutch ERUPT programme. Both of these initiatives purchase AAUs and require that the resulting funds are channelled into projects which lead to quantifiable emission reductions. A first step to bring a GIS into operation could be to seek cooperation and funding from PCF and ERUPT. However, individual countries such as Canada and Japan may already be interested in funding activities that could take place within the GIS framework, e.g. funding of capacity building in support of inventory and registry-related activities.

9.5.3 Timing

GIS must be established as soon as possible and certainly before the beginning of the first commitment period in 2008, after which setting up a separate arrangement for AAU transfers will lose both momentum and relevance. The first priority is Russian ratification, without which further development of the GIS is likely to be deemed premature. Beyond this, bilateral arrangements are likely to be quicker to negotiate than a multilateral agreement. Early bilateral agreements would establish credibility and create momentum for a GIS.

9.5.4 Uncertainties

Clearly there are many uncertainties in the road ahead for Russia and all participants in a future climate regime. This report has been predicated on entry into force of the Kyoto Protocol and a continuing Russian surplus of AAUs at least beyond the first commitment period. We are comfortable with these assumptions given our view of the current state of the climate negotiations and our projections of energy demand (and hence emission) trends (Chapter 4). Yet we are aware that they are not universally shared either within or outside Russia. Doubts must be dispelled by a firm commitment from the Russian government to ratify the Kyoto Protocol. Allocation of AAUs in future commitment periods is another uncertainty which will affect assumptions on the size of Russia's continuing AAU surplus. In the future, and particularly after 2012, developing countries may be included, the US may rejoin and the roles of all Kyoto Protocol actors may change substantially. Yet we remain confident that in the decade following the ratification of the Protocol the assumptions which we have made will remain robust. A GIS would provide a solution to the problem of the Russian surplus of AAUs and bring the major actors in the Kyoto Protocol into closer cooperation on GHG reduction activities. For those reasons alone it is an initiative worth time and resources.

Appendix 1

Example projects of suggested project types

Energy efficiency

Children's Hospital No. 1 energy efficiency improvements (St Petersburg, 1999)

The hospital is heated by district heating from a communal supplier. Under the previous arrangements, the district heating water went directly into a one-pipe radiator system. Hot water for domestic use was produced by mixing primary and return water from the district heating system.

The energy saving measures consisted of:

- draught preventers at windows;
- two new substations with heat exchangers for the radiator system and new automatic mixing valves for domestic hot water preparation;
- installation of approximately 100 balancing valves at the main risers for the radiator system;
- installation of 1,200 new manual radiator valves, which could later be completed with thermostatic heads; and
- balancing of the radiator system.

The achieved energy saving was 2,230 MWh/year out of a total of 7,700 MWh/year. The reduction of CO_2 achieved was 600 t/year.

New equipment:
Plate heat exchangers – SWEP (Sweden)
Heat effect-radiators – 2 x 1.2 MW
Circulation pumps – Grundfos
Balancing and Radiator valves – Honeywell

Funder: The Swedish Energy Agency, AIJ pilot programme and project host
Host: Children's City-Hospital No. 1 in St Petersburg
Consultant: The Regional Administration of State Energy Supervision of North-West Russia

Fuel switching

Derevyannoe boiler conversion (Karelia 2001)

Heat and hot water for the village was supplied by 4 coal-fired boilers (type: KVM-0.63) with an annual consumption of about 1,200 tonnes of coal and 5,400 m^3 wood waste. The project replaced two of the old coal-fired boilers by a wood fuel-fired hot water boiler of 1.2 MW capacity (type: Tamult movable grate). The heat production of the

boiler house is about 4,000 MWh. The two remaining old coal-fired boilers are used as reserve capacity.

In addition, the project includes the following equipment: new water treatment, net pumps, heat meters, necessary piping and heat exchanger.

The boiler conversion was implemented together with a similar conversion in a nearby village.

CO_2 emission reduction: 809 t/year.

Funder: The Swedish Energy Agency, AIJ pilot programme

Host: Closed Joint Stock Company 'Ton-Invest'

Consultant: Karelia Energy Efficiency Centre, Petrozavodsk

Renewable energy

Driada forestry industry complex renewable energy installation (Kaliningrad region, 1996)

The wood processing company 000 Strojkomplekt-Les (DRIADA) is located in the city of Kaliningrad. The company needs heat for its drying of wood. Waste from wood processing is available as fuel. A new 2 MW boiler was installed to cover the industry's own need and excess heat is delivered via a 170 m connection to the city's district heating system.

New equipment:
Boiler – ABB Vea, HVV 2,0 H-6
Prefumace – HOTAB, movable step grate
Flue gas cleaning – mylticiclone, <300 mg/Nm3
District heating pipes – PEN-pipes, ABB Zamech
The reduction of CO_2 achieved is 3,700 t/year.

Funder: The Swedish Energy Agency, AIJ pilot programme
Host: 000 Strojkomplekt-Les
Consultant: The Regional Centre of Energy Saving in Kaliningrad

Energy network refurbishment

Lisino Forest College district heating project (Leningrad region, 1999)

A double-pipe district heating network was installed to replace the main part of the old local network at Lisino-Corpus village. New substations were installed in 22 buildings. Savings of some 3,000 MWh per year, or 20–30% of boilers output, were obtained by eliminating water leakages from the pipes and reduction of heat losses.

The district heating refurbishment was implemented as phase 2 after a boiler conversion in 1996.

New equipment:
Pre-insulated pipes – TVEL
Distribution pumps – Grundfos
Balancing valves – ESBE, Sweden
Frequency converters – Logic, Russia
Control units – Danfoss, Denmark
Energy savings of about 3,000 MWh/year were obtained by district heating

refurbishment. (Reduction of CO_2 emissions including the boiler conversion are estimated 3,960 tonne/year.)

Funder: The Swedish Energy Agency, AIJ pilot programme
Host: Lisino Forest College
Consultant: The Regional Administration of State Energy Supervision of North-West Russia

Sources: Swedish Energy Agency information leaflets and project specific reports. All the example projects have been completed but not registered as official AIJ projects.

Appendix 2

List of member organisations of the Inter-Agency Commission on Climate Change Problems

Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET)
Ministry of Economy
Ministry of Food and Agriculture
Ministry of Atomic Energy
Ministry of Finance
Ministry of Transport
RAO UES Rossii
Ministry of Trade
Institute of Energy Strategy
State Committee on Environment Protection
State Committee on Standards
State Committee on Statistics
Ministry of Energy
Ministry of Natural Resources
Institute of Atmospheric Physics, the Russian Academy of Sciences
State Committee on Building Construction
OAO Gazprom
Institute of Global Climate and Ecology of the Roshydromet and the Russian Academy of Sciences
Ministry of Defence
Ministry of Science and Technology
Federal Forestry Service
Governmental Committee on Ecology
Ministry of Health
Ministry of Foreign Affairs
Russian Space Agency
Ministry of Civil Defence Issues and Extraordinary Situations

Some of the agencies have several representatives on the commission.

Source: The government of the Russian Federation. Statute 1187, 25 October 1999. http://cpc.hydromet.ru/texts/normdocs/doc0009.htm

Appendix 3

AIJ projects covered by this study

AIJ project	Project type	Investor country	Year	Emission reduction (CO_2 equivalent millions t/ lifetime)	Cost of reduction ($/$CO_2$ t)	State of the project
Horticulture project in Tyumen	Energy efficiency	Netherlands	1997–	N/A	N/A	Completed
Modelling and optimisation of grid operation of the gas transportation system 'Ushgorod Corridor' of Volgotransgas	Energy efficiency	Germany	1996–2000	225,000	3.10	Completed
Reforestation in Vologda	Reforestation	USA	1997–2057	858,000	1.56	Cancelled
District heating, Tikhvin	Fuel Switching	Netherlands		N/A	N/A	Cancelled
RUSAGAS: Fugitive gas capture project, Pallasovka and Saratov	Fugitive gas capture	USA	1995–2020	30,955,750	N/A	Delayed
Sanitary landfilling with energy recovery in the Moscow region	Fugitive gas capture	Netherlands	1994–1997	255,268	6.82	Completed

Other projects covered by this study

Project title	Project type	Investor country	Years	Emission reduction	Cost of reduction $/t $MtCO_2e$	State of implementation CO_2e
Polessk ZKX	fuel switching	Sweden	1996–2010	2,472	28.9	Completed
Polessk Regional Hospital	energy efficiency, energy saving	Sweden	1997–2012	5,781	12.35	Completed
Infection hospital	energy efficiency	Sweden	1998–2013	1,760	45.49	Completed
Pravdinsk district heating	fuel switching energy saving	Sweden	1997–2022	283,125	3.68	Completed
Specialist hospital	energy efficiency, energy saving	Sweden	1998–2013	6,735	21.94	Completed
Driada Wood Processing Company	fuel switching	Sweden	1996–2023	14,050	34.14	Completed
Children's Hospital No. 1	energy efficiency	Sweden	1999–2013	14,344	10.56	Completed
Krasnyi Bor district heating	fuel switching, district heating	Sweden	1998–2023	106,924	6.02	Completed
Lisino Forest College	fuel switching, energy efficiency	Sweden	1995–2020	52,118	5.41	Completed
Pysochny fuel switching	fuel switching	Sweden	1997–2011	30,052	18.73	Completed
Ilynsky Lesozavod Boiler Conversion	fuel switching	Sweden	2001–2016	58,215 (projected)	N/A	Design and planning
Derevyanka and Derevyannoe fuel switching	fuel switching	Sweden	2001–2025	20,225	5.08	Completed
District Heating Renovation in Lytkarino	energy efficiency	USA	1997–2006	485,670 (projected)	N/A	Delayed
Cheliabinsk District Heating	energy efficiency	USA	1997–2006	N/A	N/A	Delayed
CO_2 reduction in Nizhny Novgorod region	N/A	Netherlands	N/A	N/A	N/A	Completed
Energy Saving in Tatar Industry	energy saving	Netherlands	N/A	N/A	N/A	Cancelled
Nizhny Novgorod JI II	energy saving	Netherlands	N/A	N/A	N/A	Cancelled
JI in Gatchina	N/A	Netherlands	N/A	N/A	N/A	N/A
Steamer boiler house in Nizhpharm	N/A	Netherlands	N/A	N/A	N/A	Completed
Energy efficient street lightning	energy efficiency	Netherlands	N/A	N/A	N/A	Completed
Clean air to city centre	N/A	Netherlands	N/A	N/A	N/A	N/A
Karelia	N/A	Finland	N/A	N/A	N/A	Delayed
Pravdinsk, Kaliningrad	renewable energy	Finland	N/A	N/A	N/A	Delayed

Appendix 4

List of the Japanese studies on Russian projects

	Name	Sector	Initial investment cost ($million)	Recovery of investment	CO_2 emission BAU:A	CO_2 emission project B	Reduction (A-B)	Lead time (yr)
1*	Magnitogorsk steel mill renovation	Steel	NA	Commercial recovery not deemed as possible	22,760	22,010	750	2+
2*	Russian CO_2 reduction possibility identification	Steel	91	5.5	260	181	79	4
3*	Russian CO_2 reduction possibility identification	Electricity (coal to GCC)	342	Further research needed	1,245	504	741	NA
4*	Kuznetsk steel renovation	Steel (open hearth to blast furnace renovation, etc.)	126	10	3,860	1,710	2,150	4
5	Pipeline optimisation	Repair of pipeline / compressor	838	2–8	10,184	5,203	4,981	3
6	Nizhegorod heating system renovation	Boiler renovation (coal to gas)	790	18	4,486	1,811	2,675	2
7	Kamchatska heating system renovation	Geothermal/other heat pump	213	3.6	1,110	590	520	–
8	Khabarovsk oil refinery renovation	Renovation of heat exchange and electrical systems	129 (complete renovation) 16 (only energy facilities)	5.5	155	84	71	5
9	Atinsk oil refinery	Renovation of heat exchanger, furnace, waste heat utilisation	111	7.8	1,690	1,260	430	5
10	Kuibyshev oil refinery	Renovation of heat exchanger, furnace, waste heat utilisation	190	11.6	1,923	1,444	479	4

	Name	Sector	Initial investment cost ($million)	Recovery of investment	CO_2 emission BAU:A	CO_2 emission project B	Reduction (A-B)	Lead time (yr)
11	Ryazanskaya power station	Electricity (coal to GCC)	720	30	6,859	5,532	1,326	5
12	Khabarovsk power station	Electricity (coal plant upgrade)	714	30	7,150	5,944	1,206	5
13	Thermal power plant renovation of the Far East region	Upgrade and replace (to gas) of coal plants	912	30	11,160	7,780	3,380	5
14	Chekinskaya power station	Electricity (gas to GCC)	351	30	3,591	1,854	1,737	5
15	Sakhalin power station	Electricity (coal to GCC)	930	NA	3,967	2,150	1,817	4–6
16	Igumnovaskaya power station	Electricity (gas/ coal to GCC)	340	13	3,533	1,694	1,859	5
17	Repowering of 3 power plants	Electricity (gas/oil to GCC)	3,963	30	15,387	10,550	4,837	5
18	Konakovo power plant	Electricity (gas/oil to GCC)	957	22	6,400	4,100	2,300	5
19	Amursk power plant	Electricity (gas to GCC)	211	13	1,680	700	980	4
20	Irkutsk cogeneration	Electricity (gas to GCC)	75–709	3.2-10.9	6,663	3,607	3,057	6
21	Coal plant renovation	Electricity (gas to GCC)	1,653	not studied	27,191	15,159	12,027	
22	Severstali steel energy conservation	Renovation of steel mill	137	not recoverable			372	3
23	Novoberitsk steel energy conservation	Renovation of steel mill	272	not recoverable			408	4
24	Ufa oil refinery	Furnace renovation and waste heat utilisation	26–39	3-6 (av.5)			297	1–1.5
25	Omsk oil refinery	Process optimisation, network renovation	4.6	4	473	404	68	20 mo.
26	Norsi oil refinery	Renovation of distilling and desulphurisation facilities, etc.	40	18.1			123	2
27	Surgut 1 power plant	Electricity (gas to GCC)	615	24			1,509	4.5

	Name	Sector	Initial investment cost ($million)	Recovery of investment	CO_2 emission BAU:A	CO_2 emission project B	Reduction (A-B)	Lead time (yr)
28	Moscow province district heating	Gas boiler to gas turbine cogeneration	208–268	8–10			284	3
29	St Petersburg cogeneration	Gas cogeneration scrap and build	195	13			1,480	3
30	Kuznetsk coalmine methane recovery	Recovery and utilisation of coal mine methane	31	15			201	3

Source: NEDO

Notes: * *FS proponents: Nippon steel*

Some of the investment cost were originally expressed in Japanese yen. These were converted using 130JPY per USD. GCC: gas combined cycle. Price of CO_2 is not included upon calculation on investment recovery.

Appendix 5

A description of the proposed EU-wide internal emissions-trading scheme

The cornerstone of the European Union's strategy to meet its Kyoto targets is the proposed EU-wide emissions-trading scheme. The proposed Directive aims at establishing an EU framework for emissions trading in the European Economic Area (EEA),[91] to create an EEA-wide emissions market. Under the Commission's proposal for a cap-and-trade system, emissions trading would start in 2005. In its first stage it will cover only CO_2 emissions from large industrial and energy installations. Such installations number about 4,000–5,000 across the EU and are estimated to account for about 46% of total EU CO_2 emissions in 2010. The principle sectors covered are electricity and heat generation, cement production and pulp and paper production, which alone represent some 40% of overall EU CO_2 emissions. The chemicals sector is not included – firstly, because it only contributes under 1% of total EU CO_2 emissions, and, secondly, because of the high number of chemical sector installations (approximately 34,000 plants). Nevertheless 60% of all emissions from the chemical sector are covered via the inclusion of power generation as many such installations have on-site power generators. Other sectors include refineries, iron and steel, glass, ceramics and paper and board. In 2004 the Commission will consider amending the Directive to extend it to other sectors and other greenhouse gases.

Under the proposal, each affected installation will require a permit to emit GHGs. These permits are granted according to the Integrated Pollution Prevention and Control (IPPC) Directive, the main current legislation covering all industrial emissions. The permits themselves are not tradable, but they are matched by tradable allowances that are allocated by the member state: if a company emits in excess of its permits, it must purchase additional allowances to match the additional emissions or pay a penalty. The penalty rate is either €100 per tonne of excess or twice the average market price during a predetermined period, whichever is higher. Banking is allowed and member states are free to decide whether to allow banking into the first commitment period.

During the initial period of 2005–2007, allowances will be allocated for free ('grandfathering') by each member state according to a national allocation plan (which must be approved by the European Commission to ensure compatibility with the internal market and competition rules). For the 2008–2012 period, the Commission intends to specify a harmonised method of allocation. This harmonised method has yet to be decided.

This scheme will be independent of the Kyoto Protocol's International Emissions Trading scheme but is intended to be compatible with it. Credits from the Kyoto Protocol project mechanisms will initially not be tradable within the EU system, although the

[91] The EEA countries – Norway, Iceland and Liechtenstein – are an integral part of the EU internal market and more generally share the EU's objective of economic integration without subscribing to the political objectives such as a common foreign and defence policy or the euro.

European Commission will soon consider their inclusion through an additional proposal for a directive.

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