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Belarus and the Kyoto Protocol: Opportunities and Challenges

Contents

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Executive Summary

Global trade of greenhouse gas (GHG) emission reductions as specified by the Kyoto protocol of the UNFCCC offers unique possibilities for transition economies such as Belarus. Besides the sale of emission rights at the country level in the future, the most interesting opportunity are climate investments (so-called Joint Implementation (JI) projects) where a foreign investor receives credits on emission reductions realized through e.g. installation of new technology with lower emission levels. The advantages of this scheme are straightforward: the investor receives emission credits that help him to meet the obligations in his own country, while the host-country, e.g. Belarus, can attract foreign investments, receive new technology to modernize its industry, and improve environmental quality. However, from today's perspective of a policy-maker the most interesting consideration is that benefits from JI projects can be realized today, five years ahead of the official start of the Kyoto protocol. The current paper describes the underlying developments and mechanisms and gives the necessary recommendations of how to realize this potential.

During recent years, a global market for greenhouse gas (GHG) emission reductions with a traded volume estimated at around 160 m tons of CO_2 equivalent (CO_2e) in 2001 and prices from about USD 0.1 to USD 20 per ton has already developed. This is mainly caused by activities of several countries as well as private companies who act in anticipation of the Kyoto protocol regulations. The most important examples are the GHG trading schemes in Denmark and the UK, the emission reduction principle established by the European Union earlier this year, and several initiatives of private companies such as the Chicago Climate Exchange of the BP Amoco Emissions Trading System. From the perspective of the countries in transition, which offer a large potential for climate investments (e.g. fuel switching or increasing energy efficiency), the most promising development is the establishment of so-called Carbon funds financed by the World Bank (USD 150 m) as well as by the governments of the Netherlands (USD 26 m), Germany (EUR 50 m) and France (intended). Those funds anticipate the future market by purchasing future emission credits realized in JI projects. In doing so they fulfill several purposes: first, they help establishing the necessary experiences and practices of global emission trade and thereby indicate strong commitment towards active climate change mitigation. Second, they provide an opportunity for timely preparation for firms that otherwise might face costly short-term adjustment measures once the protocol is in force. Third, they provide an opportunity for investors to speculate on the future price of emission certificates. Finally—and most interestingly from the project-country's perspective—they ensure that rewards for climate investments are paid immediately in order to increase credibility of such projects.

What difficulties might Belarus face in attracting such JI investments? To answer this question we compare current conditions for JI investments in Belarus with those of other transition economies focussing on four criteria, the scope for JI, the JI capacity, the Business environment and well as the general investment climate. We find that Belarus offers a promising perspective for such investments, especially for energy-saving projects where the country ranks fifths across 14 transition countries, but that it so far does not possess any relevant experiences (JI capacity) and therefore, ranks last in this category. Furthermore, based on standard indicators provided by international organizations and financial institutions we demonstrate the large need for improvement in the business environment, where we put special emphasize on the energy sector, as well as the general investment climate. Therefore, we conclude that despite the high potential and promising benefits of international GHG emission trade, several institutional weaknesses and political pretermissions prevent Belarus from realizing any of those promising benefits at the moment. Thus, the following policy recommendations are crucially important:

A) Sign the Kyoto protocol!

The Kyoto protocol specifies the rules of the game of international GHG emission trade. Signing this treaty is the entry ticket for any type of international GHG emission trade. Otherwise, no emission reduction can be certified.

B) Prepare for ratification!

Two types of activities are necessary:

- Economic impact study to assess all costs and benefits.
- Emission accounting according to the standards of the UNFCCC.

C) Improve institutional conditions!

This will be important in order to strengthen the position of Belarus when competing for climate investments with other transition economies. An effective and even rewarding way to do so is by initiating JI projects with carbon funds. Typically, this requires signing a Memorandum of Understanding that indicates the country's approval of the rules of international GHG emission trade as specified in the Kyoto protocol. Then, JI projects can be initiated and emission reductions can be paid for even before the country has eventually ratified the protocol.

1. Introduction

It now seems likely that Belarus will sign the Kyoto Protocol in 2004. Under this international agreement the country intends to commit itself to keep its combined greenhouse gas (GHG) emissions below the level of 1990. However due to economic decline in 1990-1995, and the change in the pattern of the fuel used Belarus' current level of GHG emissions is actually 1.5 times lower than the level, which will be negotiated under the Kyoto Protocol. Besides according to the forecast, it is expected that Belarus' GHG emissions would be growing significantly slower than the GDP. Given that the Kyoto Protocol allows countries to exchange emission reductions in order to meet their obligations, Belarus will be able to sell a part of unused emissions rights. According to the preliminary estimations obtained in the paper, potential revenue may be from USD 375 m to USD 1.5 bn. Furthermore the Kyoto protocol allows the possibility for the country to reduce emissions and collect additional revenues using project-based investments in energy saving or emissions abatement technologies. This paper investigates economic and environmental benefits are induced by Kyoto mechanisms, and focuses especially on the attractiveness of Belarus for climate investment. The paper also addresses some of the challenges that Belarus faces in developing and implementing national system to benefit from different mechanisms foreseen in the Protocol, highlights areas where there is a need for sustained efforts, and provides preliminary recommendations on how these efforts should be designed.

We will proceed in three parts. First, the different mechanisms of the Protocol are discussed as well as existing financial opportunities (funds) for JI projects. Second, some economic implications of Belarus signing of the Protocol, and assessment of the JI investment climate are provided. The final section will conclude and give the policy recommendations.

2. GHG Emission Trade

2.1. The General Principle

Trading emission certificates is not a new idea. First such ideas have been discussed e.g. in the USA in the early 1990s when previous attempts to reduce pollution levels (e.g. smog in large cities) through official restrictions and permits have proven unsuccessfully due to large administrative costs. The first concrete program, the Regional Clean Air Incentive Market (RECLAIM) and the SO_2-Allowance Trading Program (SO_2-ATP) both started in the USA with a regional or sector-specific focus and the intention to reduce emissions of NO_x and SO_2.[1] Firms in both programs receive emission certificates, which in principle are freely tradable. After the first years of operation, both programs have revealed promising results. Prices for emission certificates are believed to be efficient (equal to marginal abatement costs) while overall reduction targets have been achieved and administrative costs were reduced substantially.[2] Thus, those emission-trading schemes have proven to realize a pre-specified emission target at the lowest economic costs.

Based on this experience, the United Nations Framework Convention on Climate Change (UNFCCC) initiated the so-called Kyoto protocol in 1997. The objective of this protocol is to reduce global emission levels of greenhouse gases (GHG) from 2008 to 2012 (the so-called first commitment period) by 5.2% relative to the level of 1990[3] by initiating a scheme of global trade scheme of GHG emission certificates4 Each country that signs the protocol is assigned a certain emission target, the so-called Assigned Amounts (AA).5 After ratification, the country is obliged to meet this target in the so-called commitment period from 2008 to 2012, either by actively reducing its own emission levels, or by using so-called flexible instruments of the protocol within which emission certificates can be traded. Those instruments are:

- Emission Trading (ET): An inventory-based mechanism where a country is allowed to sell the unused emission rights (the so-called Assigned Amount Units, AAUs) if actual emission levels over the commitment period (2008-2012) are below the country's emission target (the Assigned Amount, AA).
- Joint Implementation (JI): A project-based mechanism where a country achieves a reduction of emission levels through investment in another country listed in Annex I of the protocol.[6] This reduction (relative to a pre-specified baseline) is generated into equivalent Emission Reduction Units (ERUs) and transferred on its own account.
- Clean Development Mechanism (CDM): Allows for similar emission reduction projects in developing countries (not listed in Annex I).

[1] More concrete, the RECLAIM focuses on NOx and SO2.emitting firms in the area of Los Angeles, while SO2-ATP applies to all power-generating plants in the USA.
[2] For more information see DIW and Öko-Institut (2001): Analyse und Vergleich der flexiblen Instrumente des Kioto Protokolls.
[3] A second commitment period is envisaged from 2013 to 2017, but no concrete objectives are specified as of now.
[4] Since the consequences of GHG emission, in particular climate change, are felt globally, GHG emissions are particularly suited for a global trade scheme.
[5] Typically, for countries in transition this target equals their emission levels in 1990.
[6] This list includes Belarus.

The logic of those mechanisms is as follows: Countries whose emission levels exceed their targets can either buy unused emission certificates through ET from other countries, or they have to actively reduce emission levels. However, such reduction efforts do not necessarily have to be located within the country. Rather, the two project-based mechanism (JI and CDM) ensure that such projects will be initiated in countries where the abatement costs are expected to be the lowest. Given the large differences in e.g. technology or energy efficiency across Annex I countries, differences in abatement costs are expected to be significant.

Critics to the Kyoto protocol state that such regulations are harmful for economic development because they imply a tax on future economic growth.[7] While assigned emission levels are expected to be a serious constraint in most OECD countries, this will not be a serious problem for the countries in transition where the economic decline during the 1990s has dramatically reduced current emission levels. Furthermore, the regulations also allow for so-called banking of own certificates, which means to transfer unused emission rights of the first commitment period into the second period (2013-2017) in order to prevent that the 1990 level will become a binding constraint after 2012.

2.2. Current Schemes for GHG Emission Trade

How likely is the protocol to really come into force? According to its statutes, the regulations will enter into force if at least 55 countries have ratified it, and if they account for at least 55% of GHG emissions of all countries listed in Annex I of the protocol.[8] As of September 2003, more than 100 countries have ratified the protocol,[9] but they only account for around 44% of GHG emissions. Among the countries with a still open position, only Russia accounts for emission levels large enough to enforce the protocol. If they reject to do so, will this be the end for the Kyoto protocol? For several reasons we do not think so. First, the withdrawal of the USA must not be seen forever and US firms and organizations have so far been one of the main driving forces in the development of markets for GHG emissions. Second, China, another main GHG emitter, could be taken on board. Third, European countries as well as several companies have already developed and implemented several GHG emission trading schemes in order to prepare for the regulations of the protocol. Those investments of time and money demonstrate strong commitment to the promises made to UNFCCC, and it is unlikely that in particular West European countries will step back from this road. The next section will give an overview on already developed trading schemes.

Several countries have already developed national GHG emission schemes in order to prepare on time for the challenges of global emission trade:

- In 2001, Denmark was the first country that introduced an obligatory system of CO_2 emission trade among electricity generators, Denmark's most crucial GHG emitters.
- In 2002, the UK launched a trading scheme that covers all sectors of the economy on voluntary basis. Within this scheme, the government provided a financial incentive of GBP 215 m (USD 309 m) during an auction in April 2002 and firms bit for a share of this incentive by offering binding emission reduction targets. Once the auction was closed, 34 firms have entered the scheme offering a total reduction of about 4 m t of CO_2 equivalent (CO_2e). Thus, emission reduction efforts of firms participating in this schemes will be rewarded by UKP 53.7 (USD 77.2) per t of CO_2e.
- In 2003, the EU initiated an emission-trading scheme that—with a proposed duration from 2005 to 2012—will become the first multi-national scheme in the world covering main emitters of all the Member States of an enlarged European Union. The program is designed so as to ensure compatibility to the flexibility mechanisms of the Kyoto protocol. Currently, the inclusion of Emission Reduction Units (ERUs) obtained from JI projects outside the enlarged EU is under consideration.
- Further examples for such trading schemes are the Canadian Greenhouse Gas Emission Reduction Trading Pilot or the Chicago Climate Exchange, the first voluntary program in the USA, that even envisages an opening to international trade in 2004, or the BP Amoco Emissions Trading System, a firm-specific program that was in place prior to 2002 until BP decided to participate in the UK scheme.

2.3. Financing Opportunities for JI Projects

In addition to trading schemes for GHG emissions within countries, regions and firms, several funds have already been established with the intention to develop the market for ERUs through JI or CDM projects and purchases of ERUs.[10] The first such funds where the Emission Reduction Unit Procurement Tender (ERU-PT) of the Dutch government with a volume of around USD 26 m and the Prototype Carbon Fund of the Worldbank (PCF) with a volume of USD 150 m. In 2003, German KfW launched its plans of setting up

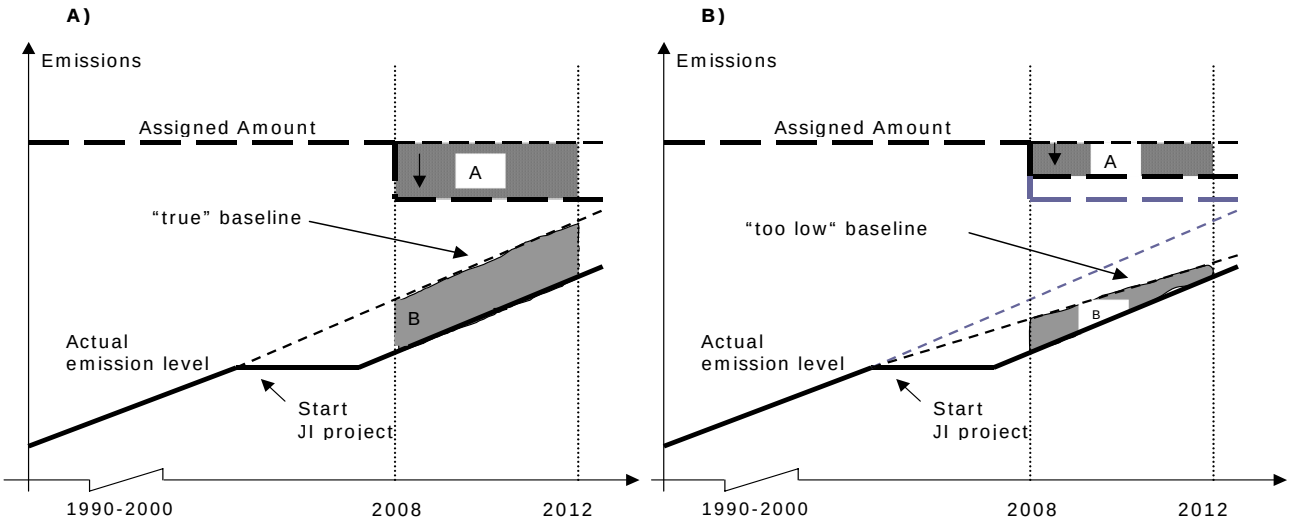
[7] For example, the USA justified their withdrawal on these grounds.
[8] Annex I countries are all OECD countries except Mexico and South Korea plus all countries in transition.
[9] Among them there are all major expected buyers except of the USA and Australia.
[10] In addition to those funds, there exist also so-called Augmented JI projects. However, since emission credits obtained by those projects will not count as ERUs in the sense of the Kyoto protocol, we refrain from a more detailed description.

an additional fund with a volume of around USD 80 m. Furthermore, the French government indicated similar considerations. In principle, all those funds operate in the same way (for simplicity we focus on the case of JI projects, the relevant one for Belarus as Annex I country):

1. Potential investors put forward a concrete proposal for a project idea that reduces GHG emission levels in a certain Annex I country (henceforth host country). This proposal needs to be approved by the fund and endorsed by the government of the host country.
2. The estimated emission level if the project is realized, as well as the estimated level if the project is NOT realized (the so-called baseline) are specified and approved by investor, fund and host country. The difference between the two defines the estimated amount of ERUs created through the project.
3. A verification plan is drafted and an independent certification institution is appointed to measure the project outcome, that is the actual emission reduction.
4. Project starts subject to regulations in verification plan and under supervision of certification institute.
5. After about one year, the preliminary project outcome is specified. The difference between expected emission levels between 2008 and 2012—the commitment period of the Kyoto protocol—and the baseline emissions is transferred into ERUs.
6. ERUs are transferred from the host country's Assigned Amount to the fund, which rewards the investor (at present, prices range from USD 3 to 9 per t of CO_2e). The fund itself redistributes the ERUs to its depositors proportionally to their deposits.

The crucial issue of JI projects is the specification of the baseline, as illustrated in figure 1. The bold dotted line gives the Assigned Amounts (AAs) per year or a certain host country, the bold straight line the actual annual emission levels. A JI project that started prior to 2008 has reduced actual emission levels. Compared to business as usual without the project (the baseline), the total amount of ERUs generated between 2008 and 2012 is given by the area B. Transferring those ERUs to the fund reduces the host country's AAs by an equal amount A (=B). If the baseline is estimated at the "true" level, the transfer of ERUs from the AAs does not affect the country's net GHG position since it is simply a zero sum transaction. This is the case in figure 1 A. If, however, the baseline is set at too low levels (figure 1 B), than also the emission-reducing effect of the project (B) is underestimated. Hence, less ERUs are specified. In this case, the corresponding deduction of AAs (A) will also be smaller so that the country benefits since its net GHG position increases. Thus, host countries will always seek to set the baseline as low as possible. On the other hand, the investor looses from a too low baseline since he obtains less ERUs. Instead, he will try to set the baseline as high as possible to generate more ERUs. But, in turn, this tends to reduce the country's net GHG position. It is expected that those diametrical interests of investor and host country will lead to a bargaining solution closed to the "true" level.

Figure 1. Schematic Development of a JI project



Source: own graph

2.4. Market Outlook

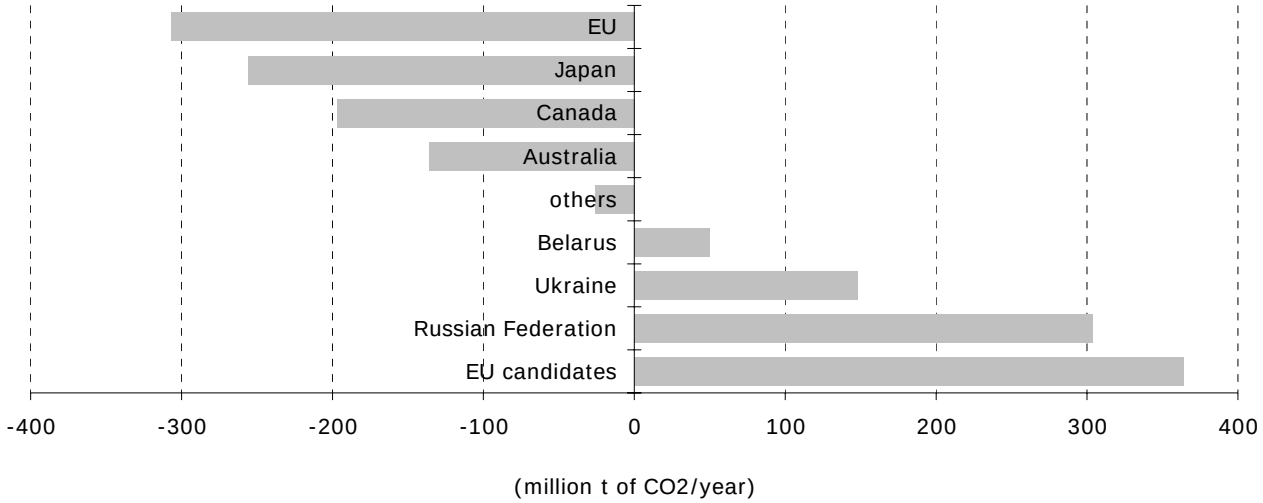
Since the Kyoto Protocol is not yet in force, the global market for GHG emission certificates is still in its early stage of development. Nevertheless, the traded volume in 2001 was already estimated at 55 to 160 t of CO_2e with prices between USD 0.1 and USD 20 per t of CO_2e.[11] Most of this demand is caused by al-

[11] Prototype Carbon Fund (PCF): Annual Report 2001. CO2e.com: Greenhouse Gas Market Overview, December 2001. The large differences in trade volume are due to missing obligations for reporting actual deals.

ready initiated national, multi-national or firm-specific trading schemes (2.2), by carbon funds (2.3) as well as by firm-level demand in anticipation of future obligations. The last point becomes evident by the observation that certificates that are compatible with the flexibility mechanisms of the Kyoto protocol sell at a quality premium of about 30%.

Price formation on the market is mainly determined by expectations of future regulations. The most reliable projections are available for future supply and demand of unused emission rights, the AAUs. According to Figure 2, the largest buyers are expected to be Australia, Canada, Japan and the current countries of the EU. On the supply side, transition economies are expected to be of main importance, since the large drop in output during the 1990s has caused a substantial gap between current emission levels and the 1990 levels, the assigned emission target for those countries.[12] In addition, Carbon sinks (e.g. through afforestation) are expected to contribute some 200 m t and the global volume of ERUs from JI and CDM projects is expected at around 300 to 400 m t of CO_2e. Under these constellations, a price between USD 5 and USD 20 per ton of CO_2e is expected to clear the market.

Figure 2. Estimated Supply of unused Emission Rights (AAUs) by Country in 2010



Source: Petrel, J. (2001). PCF JI project cycle after COP7 and preparedness of EIT countries.

To summarize, in anticipation of global trade in GHG emission certificates as specified by the Kyoto protocol, several countries have already initiated national or even multi-national programs. Furthermore, carbon funds as well as firm-level demand in anticipation of the future create additional activities. Although it is still too early to assess successes and shortcomings of global GHG emission trade schemes, the examples mentioned have already demonstrated that trade of GHG emission certificates is a real issue that can lead to efficient outcomes, both in economic as well as in ecological perspective.

3. Potential and Benefits for Belarus:

Having described recent developments and opportunities on the global market for GHG emission certificates, we will now check the extent to which Belarus could benefit from those developments.

3.1. The contribution of different categories of sources for GHE

As a regular party of the UNFCCC, Belarus is obliged to submit reports on climate change policy in regular intervals. In the first such report, GDP is expected to grow by factor 2.7-3 between 2000 and 2020, while GHG emissions are expected to increase only by factor 1.5 (from 52.4 m to 76.5 m t), which is 36.5 % below the level of 1990. The significantly slower growth of GHG emissions compared to GDP is explained by decreasing fuel consumption due to switches from oil to gas in energy production together with prioritization on resource/energy technologies.

Table 1. Contribution of Source (Sink) Categories to Aggregate GHG emissions (m. t, per cent)

Categories of GHG sources and sinks	Aggregate GHG emissions			
	1990	1995	2000	2020
Energy	107.5	66.7	53.4	75.6
Industrial processes	2.2	1.2	1.6	1.8
Agriculture	20.6	12.9	12.8	15.3
Land-use change and forestry	-12.6	-17.7	-18.5	-18.5
Waste	2.6	2.1	2.9	2.3
TOTAL	**120.5**	**65.2**	**52.4**	**76.5**

Source: First National Communication.

[12] Those large contingents of AAUs are commonly referred to as “hot air.”

When signing the Kyoto Protocol Belarus intends to assign its level of GHG emissions in 1990 as obligatory emission target for the period from 2008-2012. In this case, and with expected emissions levels given in table 1, Belarus will hold an amount of unused Assigned Amounts (AAs) of about 220 m t of CO_2e. Those units can be entirely transformed in Assigned Amount Units (AAUs) and sold via the Emissions Trading (ET) mechanism. However, selling the entire stock of unused AAs imposes the risk that emission certificates will have to be bought from abroad at if the 1990 level becomes binding at some point during the second commitment period of the protocol (2013-17). Since as of today no clear rules have been defined about the Kyoto mechanisms after 2012, it appears advisable to bank a sufficient amount of AAs for those coming periods and sell only about 1/3rd (75 m t). With prices currently estimated within a range of USD 5 to 20 per t of GHG in CO_2e,[13] the total potential revenue may be from USD 375 m to USD 1.5 bn.

As argued above, the second—and at this current state of market development more promising—path through which Belarus stands to benefit from GHG emission trade are Joint Implementation projects. Naturally, an assessment of Belarus' potential in this segment should start with a quick look at the main sources of CO_2 emissions in the country.

The main source of GHG emissions is the *Energy* sector, which is estimated to account for 80% of aggregate GHG emissions by 2020, followed by agriculture with a share of almost 20%. The contributions of industry of about 2% are fairly insignificant.

For the percentage figures: land uses, as sink doesn't create emissions, thus percentage of emission levels relate only to the positive figures.

The Belarusian energy economy includes fuel mining, transportation, storage and primary processing, generation and transmission of electric power and heat. Burning fuel to generate heat and electric power is the main source of GHG emissions. Belarus uses mainly natural gas and fuel oil for this purpose, but all possible fuel types are fired at small-scale boiler plants as well.

In view of the determining role of CO_2 emission from energy-generation use of fuel, significant reduction potential has been identified in modernization of large combustion plants in combination with low efficiency boilers and turbines, incorporating combined heat and power facilities (CHP) There are opportunities to achieve lower emissions through reduction of power transformation and distribution losses, and insulation of hot water and steam piping systems. Besides there are differentiated opportunities for growth of renewable energy sources such as wind or solar energy depending on local conditions.

The major GHG emission sources in Belarus' industry are the construction industry, metallurgy, chemical and petrochemical industries.

It is envisaged that reconstruction of oil refineries (Mozyr OR and "Naftan" OR) will help improve the degree of oil refining to 85%, i.e. very close to world standards; this will help reduce greenhouse gas emissions (primarily carbon oxides) not only at the stage of primary oil refining, but also at all stages of use of the final products.

To conclude, the Belarusian economy and in particular the energy sector appears to be a highly promising targets for climate investment through the JI mechanism. However, as with any kind of investment, the extent to which investment expectations can be realised depends crucially on the quality of the investment climate that the country offers. The following section will investigate the investment climate for climate investment in Belarus and compare it with other economies in Transition.

3.2. The Investment Climate for JI in Belarus

In general, there are large potential benefits from JI projects for economies in Transition. In addition to reduced investment, JI projects will stimulate further investments and stimulate transfers of modern technologies and know-how. Aggregate annual flows of additional environmental investment to economies in transition in the context of JI projects are estimated to range from USD 2.4 bn to 5.8 bn.[11] All 14 transition countries listed in annex I (incl. Belarus) will have to compete for this investment, and the decision of an climate investor will mainly be driven by the attractiveness of JI projects in a specific country and the motivation and ability of the country to host such projects. The investigation about the relative position of the 13 transition economies that have already signed the Kyoto Protocol has recently been presented by the EBRD. Here, we expand this study by including and comparing Belarus with the other 13 countries. This analysis attempts to determine, which aspects of Belarus JI investment climate will be perceived as attractive by interested investors, and where further improvement is called for. In particular the following four factors are investigated:

1. Scope for cheap emission reduction (Scope for JI);

[13] Due to the withdrawal of the USA from the Kyoto Protocol, demand for emissions reductions decreased substantially. In contrast, supply of emissions reductions has been largely unaffected leaving to downward pressure on the price on the emissions market.

[11] Jan Pretel 'PCF JI Project Cycle after CoP7 and Preparedness of EIT Countries'

2. The institutional capacity to host JI projects (JI capacity);

3. The Business environment;

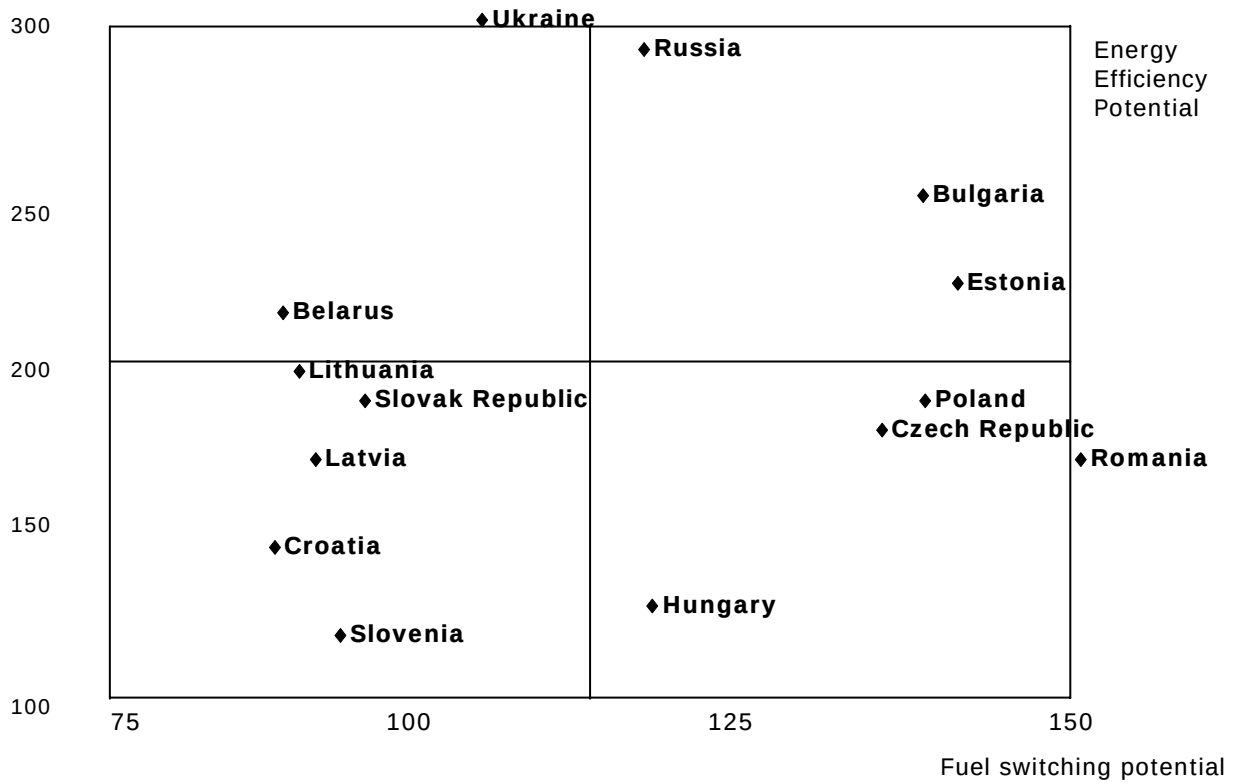
4. General investment climate, including factors such as political and economic stability, progress in privatization, liberalization and structural reforms, the quality of the legal system, and the prevalence of the corruption.

Scope for JI

The scope for cheap emission reductions is typically measured by carbon intensity (carbon emission per consumed energy) and energy intensity (energy consumption per GDP). Carbon intensity can be interpreted as a rough measure of a country's fuel switching potential (the replacement of high carbon fuel with low carbon fuel). Energy intensity is a kind of approximation of an economy's potential to improve energy efficiency. Figure 1 compares carbon and energy intensities of the 14 Annex I countries in transition relative to the EU average (EU=100). It turns out that Belarus ranks fifth with Energy Efficiency potential two times above the EU average, while its fuel switching potential is below the EU average. Thus, Belarus appears to be particular interesting for projects aiming at improving energy efficiency rather than on replacing carbon-intensive energy fuels.

As a summary indicator and rough measure of countries' JI potential the expected carbon emission per GDP in 2010 is used (Table 1), since it aggregates the carbon intensity (C/E) and energy intensity (E/GDP).

Figure 3. Energy and Carbon Intensity



Source: World Development Indicators and UNFCCC

Note: The energy efficiency potential is calculated as energy intensity (energy use over purchasing power parity corrected GDP) relative to the European Union average (EU = 100). The fuel switching potential is calculated as carbon intensity (greenhouse gas emissions over energy use) relative to the EU average (EU = 100). The totals for Romania and Ukraine lie outside the graphed area in one of the two categories. The Ukrainian energy efficiency score is 440 and the Romanian fuel switching score is 206. The Belarus fuel switching score (carbon intensity) is 86 and energy efficiency score is 200[12]

JI capacity

For countries willing to host climate investments it is crucial to develop their institutional framework, such as effective and transparent procedures for the review, approval and registration of emission reduction projects etc. The absence of comprehensive JI and climate change strategies may lead to random project selection and aimless use of obtained financial resources. It should be noted that despite the technical assistance provided by the donor community (e.g. support of the development of emission inventories,

[12] The score amounts up to 250 if the national statistics are used.

pilot JI projects, so-called Activities Implemented Jointly (AIJ) projects) the JI institutional capacity of the transition countries is still mostly under preparation (see Appendix).

Nevertheless some countries have already undertaken substantial steps clarifying JI policies and responsibilities within the government. For example, Poland was one of the first EITs, which established a JI strategy, and project selection criteria, hosted several pilot projects (AIJ projects) and 5 JI projects, and since 1996 has had a JI office. All progress has been summarized in an indicator of JI capacity by the EBRD to which we added the corresponding level for Belarus (table 2).

The results in table 2 show that most advanced countries are Hungary and Czech Republic, followed by Poland and Slovakia. Belarus is bad placed, since none of the required steps such as drafting an own JI policy or implementing a national registry system have been undertaken thus far.

Table 1. Indicator of JI scope and production cost

	Carbon emissions per GDP, 2010 (tones of carbon/million US$)	Scope for low cost JI (ranking)
Ukraine	2530	1
Bulgaria	1328	2
Russia	1164	3
Romania	683	4
Belarus*	**668**	**5**
Poland	402	6
Lithuania	393	7
Czech Republic	380	8
Estonia	360	9
Slovak Republic	337	10
Latvia	296	11
Hungary	205	12
Croatia	176	13
Slovenia	120	14

Source: EBRD
*Authors' assessment

Table 2. Indicator of JI capacity

	JI capacity indicator	JI capacity ranking
Czech Republic	4-	1
Hungary	4-	1
Slovak Republic	3+	3
Poland	3+	3
Romania	3	5
Latvia	3-	6
Bulgaria	3-	6
Estonia	3-	6
Lithuania	2+	9
Russia	2	10
Slovenia	2-	11
Croatia	2-	11
Ukraine	1	13
Belarus*	**1-**	**14**

Source: EBRD. *Authors' assessment.
Note: The indicator is based on the following classification system:
1 Initial national communication, proposals for policies and institutional structures, little training and experience.
2 Regular national communications, provisional authorities appointed, procedures and responsibilities unclear, some training and experience.
3 Regular national communications, Kyoto ratified, JI policy adopted, provisional authorities appointed, national registry and inventory in place, procedures and responsibilities cleared, good capacity and prior experience.
4 Kyoto ratified, good inventory, registry established, designated authority, national system under preparation, supplementary information being provided, on course for track two, several JI projects hosted, but no transfer of emission reductions yet.
4+ Eligible for track one, several JI projects hosted and emission reduction units successfully transferred.

Business environment

Like any other foreign direct investment, JI projects are rather sensitive to the general business environment, which they face in transition countries. Table 3 provides the insight into the quality of the business climate in EIT and shows that Belarus has the lowest score in almost all indicators except business environment assessment (eight place in ranking). As the last evaluation is concerned it presents combined measure calculated as an unweighted average across seven dimensions: finance, infrastructure, taxes, regulation, judiciary, crime, corruption and for Belarus rather high scores (existence of serious obstacles) in taxation, access to finance, regulations – which is the issues for business people everywhere – are mitigated by low score in corruption and crime. Furthermore caution is necessary when interpreting the BEEPS results as they reflect the experience of firms already active in a country and may differ from perceptions of foreign firms, which consider entering the country.

Table 3. Qualitative assessment of the business climate

	Governance and Enterprise restructuring*	Competition policy*	Infrastructure*	Business Environment**
Belarus	**1**	**2**	**1+**	**2.14 (8)**
Bulgaria	2+	2+	3-	2.22 (10)
Croatia	3-	2+	3-	2.11 (7)
Czech Republic	3+	3	3	2.01 (6)
Estonia	3+	3-	3+	1.79 (3)
Hungary	3+	3	4-	1.77 (2)
Latvia	3-	2+	3	1.88 (4)
Lithuania	3	3	3-	2.01 (6)
Poland	3+	3	4-	2.45 (13)
Romania	2	2+	3	2.33 (12)
Russia	2+	2+	2+	1.97 (5)
Slovak Republic	3	3	2+	2.19 (9)
Slovenia	3	3-	3+	1.67 (1)
Ukraine	2	2+	2	2.25 (11)

* Sources: EBRD. Scores range from 1 to 4, with 1 indicating little progress and 4 (+) vice versa.
** Sources: Business Environment and Enterprise Performance Survey (BEEPS), 2002. The combined measure is calculated as an unweighted average across seven dimensions: finance, infrastructure, taxes, regulation, judiciary, crime and corruption. In contrast to the previous three columns, the values range from 1 to 4, with 1 indicating no obstacles to business growth and operations and 4 indicating major obstacles.

Since energy sector is the main source of GHE it can be expected that majority of JI projects will be energy related in EIT countries and Belarus as well. Hence, as climate investors will look at energy sector where reforms are well advanced, for JI projects to materialize, the sector reforms are needed in terms of industry structure, governance and the investment climate. Despite substantial progress in reforming energy sector, subsidized heat and power prices in many transition countries distort the energy market and decreases the internal return rates of many energy saving projects, eliminates the economic attractiveness of abatement measures. Additionally, subsidized prices do not motivate consumers to save energy. Table 4 shows the pricing and revenue collection, which characterize the financial health of the sector and its commercial attractiveness for JI investments.

Table 4. The state of the energy sector

	Industrial (US cents per kWh)	Cash collection rate (in %)	EBRD energy sector transition indicator
Belarus	**5.2**	**50**	**1**
Bulgaria	3.9	85	3+
Croatia	6.7	100	3
Czech Republic	4.3	-	3
Estonia	4.1	97	3
Hungary	5.7	90	4
Latvia	5.2	100	3
Lithuania	3.8	91	3
Poland	4.5	97	3
Romania	4.8	62	3
Russia	1.6	97	2+
Slovak Republic	4.2	100	4
Slovenia	7.0	99	3
Ukraine	2.2	78	3+

Source: EBRD
Notes: For comparison, the long-run marginal cost of Western power systems is around US cents 8 per kWh. The EBRD transition indicators are based on the following rating:
1 The power sector operates as a government department. There is political interference in the running of the industry, with few commercial freedoms or pressures. Average prices are below costs, with external and implicit subsidy and cross-subsidy. Very little institutional reform has been achieved. There is a monolithic structure, with no separation of different parts of the business.
2 The power company is distanced from the government. It may operate as a jointstock company, but there is still political interference. There has been some attempt to harden budget constraints, but management incentives for efficient performance are weak. Some degree of subsidy and cross-subsidy exists. Little institutional reform has been achieved. There is a monolithic structure, with no separation of different parts of the business. Minimal, if any, private sector involvement has occurred.
3 A law has been passed providing for full-scale restructuring of the industry, including vertical unbundling through account separation and setting-up of a regulator. Some tariff reform and improvements in revenue collection have been achieved and there is some private sector involvement.
4 A law for industry restructuring has been passed and implemented, with separation of the industry into generation, transmission and distribution. A regulator has been set up. Rules for cost-reflective tariff –setting have been formulated and implemented. Arrangements for network access (negotiated access, single buyer model) have been developed. There is substantial private sector involvement in distribution and/or generation. 4+ Business has been separated vertically into generation, transmission and distribution. An independent regulator has been set up, with full power to set cost reflective effective tariffs. There is large-scale private sector involvement. Institutional development has taken place, covering arrangements for network access and full competition in generation.

Table 4 provides data that in Belarus the financial ability of JI projects is likely to be affected by poor collection rates, regulatory impediments (few commercial freedom), lack of institutional reforms, and the fact that power sector operates as government department.

Table 5. Country Risk Rating

	ICRG risk rating	Institutional Investor credit rating	Euromoney country credit rating	Moody's
Belarus	**59.8**	**14.4**	**30.7**	**-**
Bulgaria	67.3	37.1	42.5	B1
Croatia	70.3	45.8	49.7	Baa3
Czech Republic	73.3	60.9	63.1	A1
Estonia	73.8	55.1	55.7	A1
Hungary	72.0	64.9	65.2	A1
Latvia	71.0	47.9	53.1	A2
Lithuania	71.8	43.7	50.8	Baa1
Poland	73.8	62.2	63.6	A2
Romania	58.5	30.3	36.6	B2
Russia	66.3	26.7	37.9	Ba3
Slovak Republic	71.5	49.1	53.0	A3
Slovenia	75.8	67.0	68.9	Aa3
Ukraine	61.8	17.7	33.1	B2

Source: World Economic Indicators

Table 6. Indicator of general investment climate

	FDI per capita (5-year average, US$)	WEF (global ranking)	EBRD	Investment climate ranking
Belarus	**28.2**	**-**	**2**	**14**
Bulgaria	86.9	62	4-	10
Croatia	244.4	58	3+	9
Czech Republic	412.2	40	4	3
Estonia	287.9	26	4	1
Hungary	202.8	29	4	2
Latvia	152.6	44	4-	8
Lithuania	140.2	36	4-	5
Poland	189.9	51	4-	7
Romania	57.5	66	3+	11
Russia	24.6	64	3	12
Slovak Republic	175.8	49	4	4
Slovenia	128.6	28	4-	6
Ukraine	13.0	79	3	13

Source: EBRD and WEF (2003).
Note: The WEF index shows the ranking of countries in their global competitiveness table. For comparison, the US is ranked first, Germany 14th, France 30th and Italy 39th. The EBRD transition indicators range from 1 (no progress) to 4+ (fully functioning market economy). The table shows the aggregate score over all reform dimensions assessed by the EBRD. The ranking in the final column was obtained by taking the unweighted average over the three indicators.

General Investment Climate

The location of JI projects is highly influenced by the level of country risk. Not only JI investors, but project sponsors, donor organizations, and supporting institutions (e.g. Prototype Carbon Fund) use in the process of decision-making country risk assessment. The ratings are produced by different rating agencies, e.g. Standard& Poor's, Moody's, Fitch and some others and based on overall economic indicators, as well s credit rating of the government. Table 5 shows the country risk rating of the four agencies, but the assessments are broadly consistent across them.

According to the ratings, Czech Republic, Poland, Slovenia, Hungary, and Estonia are the least risky country, while almost all agencies under consideration[13] confer Belarus the highest country risk. For ease of comparison, the data on FDI per capita (total FDI is a reasonable proxy for energy-related FDI) is used as reflection investment climate, i.e. the relative investors satisfaction with business environment. Besides two more indicators complement the measurement of business environment. The first is competitiveness index developed by the World Economic Forum and the second, presents aggregate score of the EBRD's transition indicators, which measure progress in privatization, liberalization, enterprise performance and financial sector reform.

As it is shown in Table 6 Belarus obtains the lowest investment climate ranking, which means that in Belarus business environment creates the most severe problems among JI transition countries for foreign investors.

Table 7 summarizes all four dimensions, which determine the possibility of JI investment. The indicators show that in terms of JI scope Belarus is characterized as particularly attractive, but the country business environment and investment climate are notoriously difficult and it seriously lagging behind in developing

[13] Moody's does not include Belarus in assessments.

JI capacity. It means that investors may move away towards the countries with more favourable investment climate. Nevertheless, it should be realized that development of JI capacity and sufficient improvements in business environments together with relatively high scope for JI may develop Belarus into an attractive JI country over medium run.

Table 7. Summary ranking – scope for JI, JI capacity, business environment and investment climate

Rank	Scope for JI	JI capacity	Business environment	General Investment climate
1	Ukraine	Czech Republic	Slovenia	Estonia
2	Bulgaria	Hungary	Hungary	Hungary
3	Russia	Slovak Republic	Estonia	Czech Republic
4	Romania	Poland	Latvia	Slovak Republic
5	**Belarus**	Romania	Russia	Lithuania
6	Poland	Latvia	Czech Republic	Slovenia
7	Lithuania	Bulgaria	Croatia	Poland
8	Czech Republic	Estonia	Lithuania	Latvia
9	Estonia	Lithuania	**Belarus**	Croatia
10	Slovak Republic	Russia	Slovak Republic	Bulgaria
11	Latvia	Slovenia	Bulgaria	Romania
12	Hungary	Croatia	Ukraine	Russia
13	Croatia	Ukraine	Romania	Ukraine
14	Slovenia	**Belarus**	Poland	**Belarus**

Source: EBRD, authors' assessment.

4. Conclusions and Policy Recommendations

To conclude, global trade in GHG emission certificates has already become reality with trading schemes of Denmark, the UK or the EU, as well as activities of multinational firms and trading houses initiating market transactions. In addition, an increasing number of carbon funds has stimulated the demand for emission certificates generated by so-called climate investments within the JI or CDM mechanism of the Kyoto protocol.

How should Belarus respond to these developments? To assess this question, the paper reviews the potential benefits. In addition to the possibility of direct sales of unused emission certificates, we find a particularly large potential for climate investments. Especially the energy sector is in urgent need for further modernization in order to improve energy efficiency. Here, rewards for newly created emission certificates could be an attractive source of additional financing. In addition, such climate investment schemes are also an excellent way to attract foreign investors and new technologies.

Despite the high potential and promising benefits of international GHG emission trade, several institutional weaknesses as well as political pretermissions prevent Belarus from realizing any of those promising benefits at the moment. Thus, the following policy recommendations are of crucial importance:

A) Sign the Kyoto protocol!

The Kyoto protocol specifies the rules of the game of international GHG emission trade. A country's signature under this treaty is the entry ticket for any type of international GHG emission trade. Otherwise, no emission reduction can be certified.

B) Prepare for ratification!

Two types of activities are necessary:

1) Economic impact study:

Each country should assess economic costs and benefits of the regulations of the protocol. We have already discussed the benefits in detail. The main costs will be for building institutional capacities. As experience in other transition countries shows, most of those tasks can be (co-)financed by international donor organizations.

2) Emission accounting:

Each country has to be able to correctly account for its GHG emissions. Therefore, a national emissions inventory and allowance registry has to be in place and emission levels have to be reported according to the standards of the UNFCCC.

C) Improve institutional conditions!

This will be of crucial importance to strengthen the position of Belarus when competing for climate investments with other transition economies. In part 3 we identify the main institutional weaknesses (see table 7). Improving the investment climate is of general economic importance. As for the business environment, **special emphasize should be given to increasing energy efficiency, in particular in the energy sector** by improving regulation, cash collection rates and transparency, and by separating the power sector from direct government intervention. Most importantly, **Belarus must improve its JI ca-**

pacity! An effective and even rewarding way would be to **initiate JI projects with carbon funds**. Typically, this requires signing a Memorandum of Understanding that indicates the country's approval of the rules of international GHG emission trade as specified in the Kyoto protocol. Then, JI projects can be initiated and ERUs can even be paid for before the country has ratified the protocol.

Once those measures are initiated Belarus has made the necessary commitments to UNFCCC in order to seize the benefits from international GHG emission trade.

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Minsk, November 2003

Appendix

JI responsibility and capacity

	JI policy	National registry	Provisional procedures	Dedicated JI office	JI staff	Institutions involved
Bulgaria	yes	no	yes	yes	1.5	Ministry of Environment and Water
Croatia	draft	no	no	no	5	Ministry of Environment (MZOPU) Ministry of Economy (MG)
Czech Republic	na	under preparation	yes	yes	na	Ministry of Environment
Estonia	draft	no	no	no	1	Ministry of Environment, Environmental Management: Technology department
Hungary	draft	Under preparation	under preparation	na	2	Ministry of Environment, Atmosphere Protection: Energy office
Latvia	draft	no	being drafted	no	5 (in 2003)	Ministry of Environmental Protection and Regional Development Ministry of Finance
Lithuania	under discussion	no	no	no	1	Ministry of Environment: Environmental Quality department
Poland	na	no	yes	yes	na	National Fund for Environmental Protection and Water Management
Romania	draft	no	yes	yes	4	Ministry of Environment Ministry of Industry and Trade Ministry of Agriculture
Russia	no	no	no	being reformed	2	Ministry of Economic Development and Trade Ministry of Energy Roshydromet
Slovak Republic	yes	no	yes	no	2	Ministry of Environment
Slovenia	proposal	proposal	no	no	7	Proposal to nominate working group
Ukraine	no	no	no	no	0	Ministry of Ecology and Natural Resources
Belarus*	no	no	no	no	0	Ministry of Natural Resources and Environmental Protection

Source: Samuel Fankhauser and Lucia Lavric (2002). The investment climate for climate investment: Joint Implementation in transition countries. EBRD.
*Authors' evaluations