Capacity for Climate

Economies in Transition After Kyoto
WRI-REC partnership

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Summary

This report is an overview of the challenges and opportunities presented by the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol for countries with economies in transition (EIT). Our preliminary findings include the following:

- There is a strong link between climate performance and basic economic and governance reform undertaken by EITs. The pace and pattern of transition has an important impact on countries' capacity to reduce emissions. EIT governments and societies should become more aware of the opportunities for sustainable development. Countries can capture this opportunity by linking development priorities and climate objectives. Multilateral development banks and EIT governments should integrate climate objectives in policy reforms and infrastructure investment.
- Co-benefits can be achieved by combining strategies to mitigate climate change, reduce local air pollution and manage environmental health risks. The "Environment for Europe" process, which involves the countries of the United Nations Economic Commission for Europe, should encourage the integration of climate and environmental objectives and support projects that achieve co-benefits.
- EITs should invest in building an institutional infrastructure so that they can achieve compliance and participate fully in the Kyoto mechanisms. The private sector — both for-profit and not-for-profit — in these countries can play a significant role in compensating for governments' institutional deficits and in enhancing the credibility and accuracy of information.

This report takes a regional approach and covers many climate-related issues germane to EITs without concentrating solely on a particular country or issue. The geographic reach of the report is limited to nine Central and Eastern European (CEE) countries as well as two Newly Independent States (NIS), Russia and Ukraine, that have made binding emission commitments under the Kyoto Protocol. Kazakhstan is also included in our analysis, as it has recently expressed its intention of joining Annex I of the Climate Convention. In summary, this report is a preliminary effort to take stock of regional EIT progress under the UNFCCC and identify the main areas for more in-depth country and issue-specific work.

Section I details the unique status of EITs under the Protocol. Because of this status — owing to common historical experiences as well as several special provisions in the Protocol — these countries have the potential to reap substantial benefits by combining strong domestic action on climate change with participation in the Kyoto Protocol's mechanisms, namely emissions trading and joint implementation. Such an approach would yield significant benefits, including technology transfer and improved energy efficiency, increased investment from the West and improved local and regional air quality. This section also outlines the obligations that all Annex I Parties assume under the Kyoto Protocol. These obligations may require countries to implement new domestic laws as well as develop programs that measure and report greenhouse gas emissions in a timely, rigorous and transparent fashion.

Section II takes stock of greenhouse gas emission and transition trends in EITs as well as energy sector reform progress. Although there are some encouraging signs, other developments portend future difficulties for treaty implementation. Collectively, absolute levels of greenhouse gas emissions in EITs are more than 30 percent below historical levels (because of economic decline), but development trends indicate that these reductions may not be sustained over the next 10 to 15 years. EITs also have extremely high levels of carbon intensity (measured in tons of carbon emitted *per million dollars of GDP*). The fast reformers of Central and Eastern Europe are beginning to lower their carbon intensities. This is mainly due to sound reform measures, including price liberalisation and partial privatisation in the energy sector. Carbon intensities in several Newly Independent States continue to increase from their already high levels.

Section III details the strategic actions that Annex I EITs have undertaken in pursuit of UNFCCC objectives. Initiatives include developing climate change assessments, participating in activities implemented jointly (AIJ) and reporting emissions of greenhouse gases. While encouraging, these efforts will need to be improved upon and expanded in order to fully comply with Kyoto Protocol requirements and ensure participation in the Kyoto mechanisms.

Section IV addresses some of the institutional and regulatory hurdles that EITs must overcome in order to successfully implement the treaty. This section builds on the treaty requirements outlined in Section I and the climate-related experiences discussed in Sections II and III, attempting to identify a broad set of challenges faced by EITs. Specifically, EITs must create new policy frameworks, improve institutional infrastructure, build a constituency for climate action and address the political and financial risks of reform efforts. Key recommendations are also summarised in Section IV.

The Kyoto Protocol and Economies in Transition

In December 1997, the third Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) met in Kyoto, Japan to negotiate limits to greenhouse gas (GHG) emissions. Two main features of the Kyoto Protocol, once it is ratified and enters into force, are: (1) legally binding commitments by Annex I countries[1] to collectively reduce GHG emissions by more than five percent below 1990 levels by 2008-2012, and (2) a set of mechanisms — including emissions trading, joint implementation and the Clean Development Mechanism — to help countries achieve their commitments at the lowest possible cost. The GHG limitation and reduction targets for Annex I Central and Eastern European (CEE) countries and Newly Independent States (NIS) are shown in Table 1. Commitments for these countries range from a stabilisation of GHGs at 1990 levels (Russia and the Ukraine) to an eight percent reduction in emissions by 2008-2012, compared to the base year. Box 1 summarises the mechanisms relevant to economies in transition (EITs), namely emissions trading and joint implementation.

TABLE 1

Annex 1 CEE and NIS Countries

CEE	KP target 2008-12*
Bulgaria	-8%
Czech Republic	-8%
Estonia	-8%
Hungary	-6%
Latvia	-8%
Lithuania	-8%
Poland	-6%
Romania	-8%
Slovakia	-8%
NIS	
Kazakhstan	TBD
Russian Federation	0%
Ukraine	0%

*Percentages reflect reductions from the base year (usually 1990).

The Opportunity

EIT countries are, for the most part, in a unique position relative to other Annex I Parties. These countries have the potential to reap benefits from coupling strong domestic actions to reduce GHG emissions with participation in the Kyoto mechanisms. Several factors create such opportunities.

First, GHG emission levels are already far below base year emissions for most of the economies in transition. Table 2 shows GHG emissions in 1995 (the latest available data for the three main GHGs) relative to base year emissions. Annex I EITs' 1995 emissions range from 20 to 65 percent below base year levels, with an average drop (below base years) of over 30 percent. The decline in emissions is primarily a result of the severe economic recession in the early 1990s, and — to a lesser extent —

BOX 1

Foundations for Flexibility: Articles 3, 6, 17 and Assigned Amounts

Mechanisms most relevant to CEE and NIS countries:

1. Joint Implementation (Article 6) is a project-based mechanism, designed to foster the transfer of technology and enhancement of carbon sinks. Annex I Parties may transfer to, or acquire from, any other Annex I Party emission reduction units (ERUs) resulting from project activities that reduce GHG emissions or enhance removals by sinks during the first compliance period (2008-12).

2. Emissions Trading (Article 17) is an allowance-based system that allows any Party included in Annex B of the Kyoto Protocol to transfer any "part of an assigned amount" (PAA) to, or acquire a PAA from another Party in accordance with rules to be determined.

The Mechanics (Article 3):
The Kyoto Protocol creates an "assigned amount" for each Annex I Party that represents the quantity of GHG emissions a country is allowed to emit during the compliance period (2008-2012). A country can increase its assigned amount (and therefore emit more) by purchasing ERUs (through JI) or PAA (through emissions trading) from other Annex I Parties. Conversely, if actual emissions are below the country's allowable emission level (i.e. below the assigned amount), ERUs or PAA may be sold to another Annex I Party. Parties that have GHG emissions during 2008-2012 in excess of their assigned amount may be considered out of compliance and subject to yet-to-be determined fines, penalties, etc. Although the rules and procedures for emissions trading and joint implementation have not yet been fully elaborated, Parties whose compliance is uncertain may eventually be excluded from participation.

TABLE 2

Base year GHG emissions compared to 1995 emission levels

(Million Metric Tons of Carbon Equiv.)

Country and Base Year		Base Year	1995	Change
Bulgaria	(1988)	37.1	23.9	-35.7%
Czech Rep.	1990)	52.4	41.2	-21.5%
Estonia	(1990)	11.1	6.2	-44.4%
Hungary	(1985-7)	27.7	21.1	-24.0%
Latvia	(1990)	9.7	5.2	-46.2%
Lithuania	(1990)	10.8	4.0	-62.5%
Poland	(1988)	153.9	119.7	-22.2%
Romania	(1989)	54.1	32.9	-39.2%
Russian Fed.	(1990)	818.0	575.9	-29.6%
Slovakia	(1990)	19.8	15.7	-20.6%
Ukraine	(1990)	194.1	116.0	-40.2%
Total		**1,388.7**	**961.8**	**-30.7%**

Source: UNFCCC[2]

market reforms introduced over the last decade that have improved energy efficiency in some of the EIT countries.

Second, judging from the carbon intensities of CEE and NIS countries, further GHG reductions are possible, and in many cases perhaps even cost-effective. Figure 1 shows the huge disparities between European Union and EIT carbon intensities (measured in tons of carbon per million dollars GDP, PPP). The typically high carbon intensities of CEE and NIS countries could signal an availability of low-cost, or cost-saving, emission reduction opportunities.

Third, the Kyoto Protocol makes special provisions for countries with economies in transition. For example, Hungary, Bulgaria, Romania and Poland have each invoked a provision that allows countries in transition "a certain degree of flexibility" (Article 3.4 and 3.5) when selecting the base year. On average, carbon emissions in the base years selected by these four countries are almost 22 percent higher than 1990 levels, resulting in significantly easier emission reductions requirements.[3]

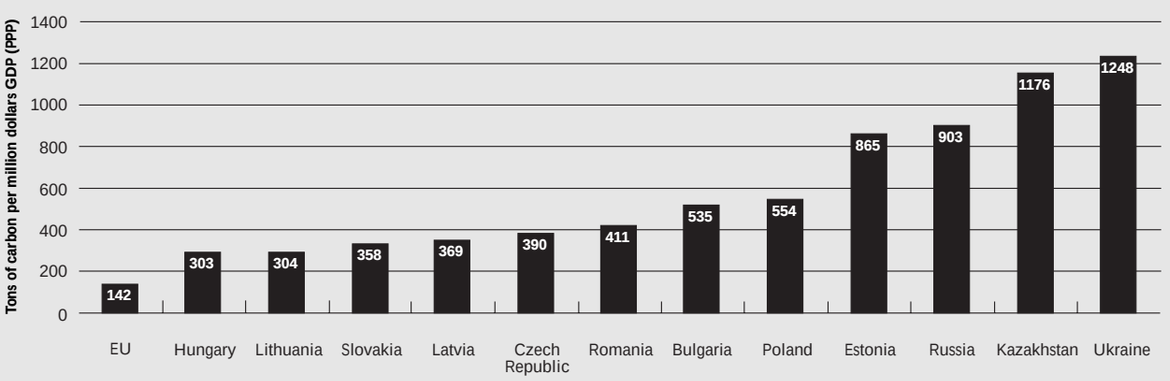
Finally, emissions trading and joint implementation could help translate these (and future) reduction opportunities into substantial economic, environmental and financial benefits. The rationale behind the Kyoto mechanisms is to assist countries in achieving their targets by allowing emission reductions to take place where they have the lowest possible cost. In doing so, they can also foster technology transfer and/or financial flows to EITs. Thus, emission reductions and emission reduction opportunities — plentiful in CEE and NIS countries — can be converted into financial assets that boost environmentally-sound development and growth. Combining strong domestic action with participation in the Kyoto mechanisms can help Annex I EITs reap specific benefits such as:

- **Upgrading Technological Capacity and Improving Energy Efficiency.** Energy intensity and carbon intensity remain high in EITs, indicating opportunities for large quantities of low-cost reductions. In addition to domestic measures, joint implementation can help transfer more energy efficient and cost-effective technology from industrialised to transition economies. These investments could help develop a more a sustainable infrastructure. New investments could be focused on the power, heating, transportation and industrial sectors, where the greatest emission reduction opportunities exist.

- **Improving Air Quality and Health.** After decades of energy intensive industrial development with little or no environmental controls, EITs possess some of the worst local and regional air pollution records in the world. Improved local air quality and health are among the priorities set by CEE and NIS governments in their National Environmental Action Plans (NEAPs) and in many of the Local Environmental Action Plans (LEAPs)

FIGURE 1

Carbon Intensity, 1996



in the framework of the Environmental Action Program for CEE (EAP) and the "Environment for Europe" process (Box 2). Better air quality and associated health improvements are also the objectives of significant financing from the National Environmental Protection Funds, Multilateral Development Banks and grant funding from bilateral donors under the EAP and "Environment for Europe" framework.[4] The "Environment for Europe" process, with its energy efficiency and cleaner production initiatives, provides a potential link with climate objectives.[5] As Box 2 suggests, positive examples of projects with combined benefits already exist in many countries.

- **Attracting Financial Flows from the West.** A combination of factors could make emissions trading an effective vehicle for attracting large financial flows to CEE and NIS countries by selling emission allowances, or parts of assigned amounts (PAA). As noted previously, emission levels are already low relative to base year levels and could remain well below base year levels if climate considerations are factored into development strategies. Evidence also indicates that the United States and other industrialised countries may wish to lower their own compliance costs by investing in EITs.[10]

These opportunities should be exploited sooner rather than later. Today's capital stock investments will have long-lasting effects on emission levels. Thus, taking advantage of low-cost reduction opportunities now will prevent countries from prematurely retiring capital stock and paying for more costly compliance measures later. Overall, it is critical that policy-makers understand that climate protection and Protocol implementation are consistent with addressing other pressing national problems. If governments can undertake economic restructuring and energy sector reform with a climate strategy in mind, benefits such as improved energy efficiency, increased financial flows, technology transfer and improved public health can be more fully realised.

BOX 2

Linking Climate to Environmental Action Plans

Since the first "Environment for Europe" Ministerial Conference in 1991 and the adoption of the Environmental Action Program for Central and Eastern Europe (EAP), countries in CEE, NIS, Western Europe and the United States — as well as the multilateral development banks — have collaborated closely to address environmental and associated governance priorities in countries in transition. Air pollution is one of the key priorities identified by both the EAP and the National Environmental Action Plans developed within this framework. Over the last few years, the focus of collaboration under the EAP umbrella has been shifting from national plans to *local* programs. Regional initiatives such as the regional working group on local air pollution[6] in Bulgaria and the activities recently planned for cities by the EAP Task Force,[7] comprehensive LEAPs and other targeted activities have been implemented to improve environmental conditions and governance in CEE and NIS cities. This shift is accompanied by bottom-up initiatives led by local governments and non-governmental organisations (NGOs).

LEAPs and other initiatives often include measures to address air pollution through municipal heating fuel conversion (Stara Zagora, Bulgaria and Zakopane, Poland), development of geothermal energy sources (Pyrzyce, Poland) and streetlighting retrofits (Rovno, Ukraine and Sofia, Bulgaria). Project objectives usually include the low-cost reduction of airborne pollution. However, these projects achieve climate objectives as well.

Experience with LEAPs and other local initiatives suggest that:

- many of the "no-regret" strategies and initiatives are taking place in cities with leadership from local governments and/or NGOs[9];
- opportunities exist for closer links between local activities and climate objectives;
- LEAPs can support local government participation in the Kyoto mechanisms and help them attract investment.

From Opportunity to Obligation: Annex I Party Responsibilities

While the Kyoto Protocol offers the potential for reaping substantial benefits, signature and ratification also signal a commitment to implement and comply with the provisions of the treaty. In some instances this will require that Parties change domestic laws, implement new laws or enact other measures to ensure that the letter and spirit of the agreement are followed. For example, a set of monitoring, reporting and review functions will be needed in order to verify that Parties are implementing and complying with the treaty's provisions. This includes preparing national GHG inventories, reporting and accounting for the "assigned amount." The importance of these functions further extends to participation in the Kyoto mechanisms. Discussions of emissions trading and joint implementation typically stress the elemental role of compliance systems and the crucial importance of establishing procedures and responses for non-compliance.[11]

Some of the Party obligations are set forth directly in the Articles of the Kyoto Protocol. However, since many of the rules and procedures that will govern emissions trading, joint implementation and compliance systems have not been finalised, this analysis is necessarily preliminary.

Meeting the Targets. The key responsibility of Annex I Parties, including the 12 EITs listed in Table 1, is to ensure that their actual emissions during the 2008-2012 period do not exceed their targets. To help achieve these target emission levels and promote sustainable development, the Kyoto Protocol gives Parties the flexibility to implement a set of policies and measures *according to their national circumstances.*[12]

In Kyoto Protocol parlance, country targets are expressed as an "assigned amount," which represents the total amount of GHG emissions that a country is allowed

to emit (Box 1). Countries may adjust their assigned amount (and therefore the target amount that they may emit) by participating in emissions trading and joint implementation. For example, a country that *sells* a "part of an assigned amount" (or PAA) through international emissions trading lowers its total assigned amount, while the purchasing Party increases its assigned amount and thus can emit more. At the end of the compliance period (after 2012) the total assigned amount of a country — taking into account adjustments made from emissions trading and joint implementation — must be greater than or equal to actual GHG emission levels.

Developing GHG Inventories. Article 5 of the Kyoto Protocol requires that countries develop a "national system" by 2007 for estimating GHG emissions by sources and removals by sinks. Although a "national system" is not defined in the Protocol, key elements might include:[13]

- institutional arrangements for inventory preparation (e.g., who undertakes it, how it relates to central policy-makers and other stakeholders, level of effort, budgeting and staffing, etc.);
- choice of method for estimation of individual emission sources or removals by sinks;
- data collection procedures (e.g., for activity data, survey techniques and frequency, for emission factors, etc.);
- review of evaluation procedures (e.g., quality assessment and control, verification or audit procedures conducted or sponsored by the national inventory program).

Inventories must also use "methodologies accepted by the IPCC."[14] Generally, the Intergovernmental Panel on Climate Change (IPCC) methodologies are flexible and open-ended.[15] They also provide comparative methods for calculating emissions data by region or country for those Parties (like EITs) attempting to compile inventories on limited information resources. The latest published IPCC methodologies are the *1996 Revised IPCC Guidelines*. In 1997 the IPCC decided that updating the guidelines will occur roughly every five years — thus Parties will need to adapt and keep track of changing technical methodologies and reporting formats. To further promote accuracy, the Protocol (Article 5) requests that Parties "formulate… where appropriate… programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories."

Inventories are the main vehicle through which countries must demonstrate that their actual emissions, from the 2008-2012 period, do not exceed their assigned amount. Because of the importance of inventories, Parties are likely to insist on completely transparent estimation methodologies and strict international review procedures.

Timely and Accurate Reporting. Reporting under the Protocol will likely take two forms: *annual* GHG inventories and less frequent national communications (already being submitted under the Climate Convention). National communications include elements such as GHG inventories, a description of policies and measures implemented to combat climate change and any other information relevant to achieving the objectives of the Climate Convention.[16] As part of the GHG inventory and national communication submissions, countries must submit "the necessary supplemental information" to demonstrate compliance with the Kyoto commitments. Necessary "supplemental information," according to the OECD, might include, *inter alia*:[17]

- a description of the national system for estimating GHG emissions and removals;
- an overview of the national inventory from 1990 to the most recent available year and a discussion of trends with respect to national policies and measures to mitigate GHGs;
- an overview of the aggregate transfers and acquisitions under the Kyoto mechanisms and of changes to national target amounts;
- a demonstration that emissions reduction units (ERU, from JI) and/or changes in stock from land use change and forestry activity are verifiable.

Another essential reporting requirement, specific to countries with economies in transition, is to declare a base year or base period (if other than 1990). Bulgaria, Romania, Poland and Hungary have each declared non-1990 base years.

International Emissions Trading and Joint Implementation Requirements. Countries that wish to participate in international emissions trading will face a set of additional minimum requirements. First, just as countries must account for their actual emissions, they must also account for their *allowable* amount of emissions (i.e., their assigned amount). Toward this end, CEE and NIS countries will likely need to create and maintain a system to account for changes in their assigned amount that result from international emissions trading and joint implementation transactions. Accounting for changes in a Party's assigned amount that result from trading could be a minimum requirement for countries.[18]

A second minimum requirement could be compatible and transparent record keeping of all transactions from emissions trading and joint implementation. Changes in ownership of PAA or ERUs will need to be tracked and accounted for to facilitate dispute resolution and verification by international bodies. Similarly, countries may need to develop systems to ensure full public disclosure of transactions. Finally, if non-state actors are allowed to participate in the trading system, it is the sovereign responsibility of each Party to authorise the participation of any "legal entities" (such as private sector entities) that buy, sell or broker trading permits.

Domestic Emissions Trading Requirements. In addition to the requirements for international activities discussed above, additional measures need to be implemented by countries that wish to establish a *domestic*

emissions trading system. Minimum requirements for an efficient domestic market could include:[19]

- the creation of a tradable unit, such as an "authorisation to emit," implemented through domestic laws;
- the regulatory authority to assign allowable emission amounts to domestic sources, enforce these limitations and verify emission levels;
- adequate enforcement of private contracts;
- market competition among many actors and provisions to allow entry of new domestic sources into the trading system;
- the ability to sanction domestic entities not complying with their emission limitations (i.e., enforcement).

The Kyoto Protocol allows trading between parties (i.e., public authorities or governments). In order to increase economic efficiency, proponents of international emissions trading envisage domestic entities other than governments participating in international trading. For example, a privately owned electricity generating plant in Poland would be able to sell excess PAA to other participating entities in Poland or foreign countries. For Parties that wish to establish domestic trading (which may interact with international trading), the required regulatory changes are likely to be greater.

Emissions and Energy

Complying with the Kyoto commitments and implementing its mechanisms presents a challenge for all Annex I countries. Annex I EIT efforts have already resulted in some positive developments and demonstrate commitment to respecting their obligations. However, CEE and NIS countries are also encountering difficulties in policy implementation, energy sector reform and GHG emissions monitoring and reporting. This section identifies GHG emission trends and investigates progress in transition reform, including the creation of policies and measures that support the achievement of climate-related commitments.

GHG Emission Trends

Judging from the latest available GHG emission levels — shown in Section I — the Kyoto Protocol targets may seem within easy grasp. Yet projections suggest that EITs may not be able to sustain past reductions over the long term and, consequently, may not be able to meet their Protocol commitments. In Bulgaria, for example, under a business-as-usual scenario carbon emissions are projected to surpass base year levels by 2005. Under a GHG-mitigation scenario Bulgarian carbon emissions are projected to remain below 1990 levels through at least 2015.[20] The same is true in Slovakia, where several projections — including those that factor in energy saving and other mitigation measures — estimate emissions in excess of 1990 levels before 2010.[21]

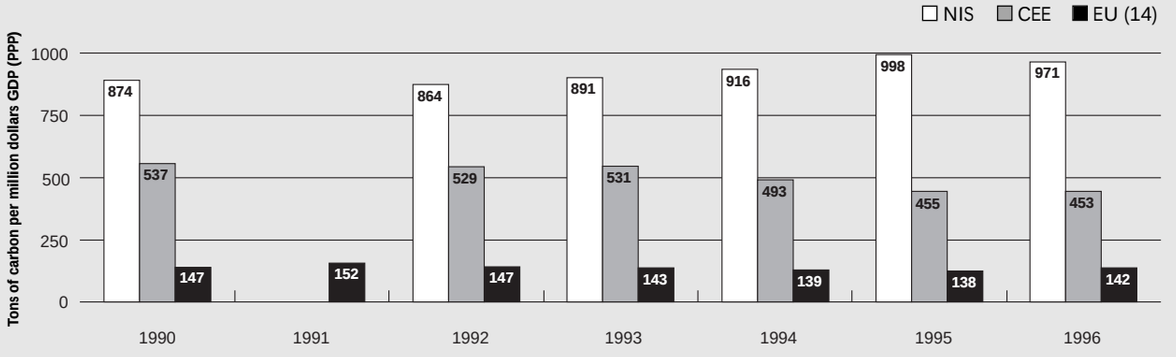
Since 1994, emission levels in CEE countries have begun to recover in tandem with economic growth and changing consumption patterns. Residential, commercial and transportation energy consumption levels are increasing and beginning to resemble those of OECD countries.[22] Increased emissions are particularly noticeable in the transport sector, where the rapid switch from public to private automobile transport over the last ten years in all EITs has been accompanied by a deterioration of the public transport system and significant investments in highway infrastructure.[23] For example, Poland is taking a second, USD 300 million loan from the World Bank to build 6,200 kilometres of new highways. These new roads are intended to remedy the increasing volume of traffic, expected to double by 2000 (from 1988 levels).[24] Likewise, projections in the 1996 Bulgarian National Communication forecast emission increases of at least 225 percent in the transport sector, compared to 1988 levels.[25]

More significantly, carbon intensity remains high in all EITs. As Figure 2 indicates, in 1996 the carbon intensity of Russia, Ukraine and Kazakhstan (NIS) was almost seven times higher than that of the European Union.[26] The average carbon intensity for nine CEE countries surpassed European Union levels by a factor of more than three.

Although the CEE and NIS economies in transition share a common recent past, they are an increasingly heterogeneous group. The pattern, pace and depth of reform vary across EITs and there are significant differences among countries. Despite these differences, EITs can be grouped depending on the depth and pace of the transition reform. The 1997 EBRD Transition Report clusters countries in two reform groups — "fast" and "slower" reformers — with East-Central Europe and the Baltics belonging to the first group, and Southeast Europe, Russia and Ukraine forming the second group. There are, however, significant differences within each of these

FIGURE 2

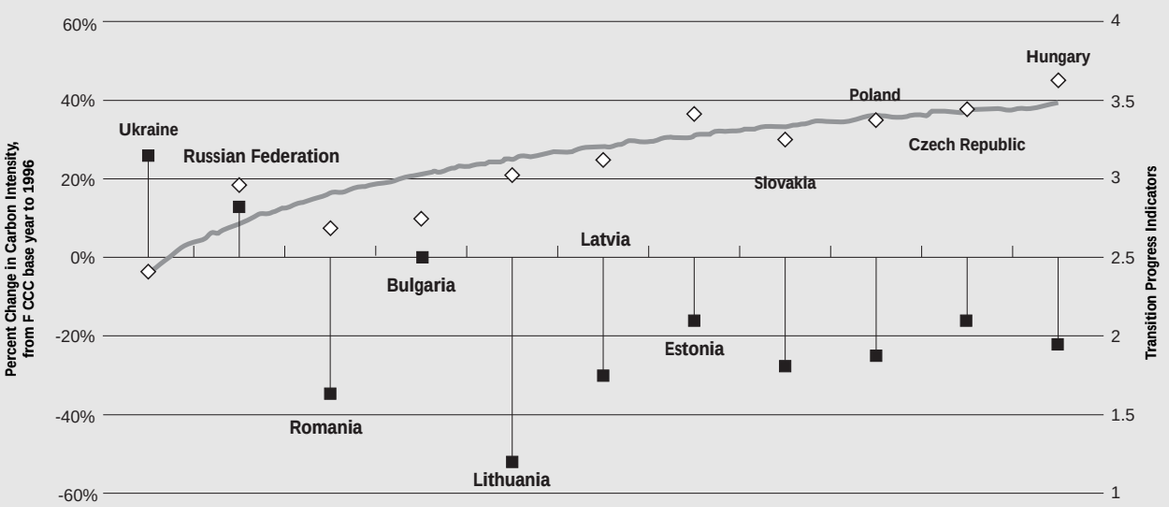
Carbon Emissions Intensity, 1990-1996



Sources: UNFCCC, Carbon Dioxide Information Analysis Center and the World Bank

FIGURE 3

Transition Reform and Carbon Intensity



Note: For transition indicators "1" indicates little progress, "4" indicates performance of advanced industrial economies.
For point indicators "white points" indicate progress in transition; "black points" indicate change in carbon intensity compared to base year.

Source: EBRD Transition Report; World Bank; CDIAC

groups. Thus, as Figure 3 indicates, there is a trend of generally faster and deeper policy and institutional reform in the Western part of the region, and weaker, disconnected reform in the Southern and Eastern EITs.[27]

A review of carbon intensity trends indicates that fast reformers have less carbon intensive economies. The carbon intensity of the slow reformers is in some cases even increasing compared to base year levels (e.g., Russia and Ukraine). Ukraine's carbon emissions per million dollars of GDP (PPP) rose from 994 to 1,194 from 1990 to 1995.[28] Likewise, although carbon emissions in the Russian Federation fell by more than 169 million metric tons of carbon (MtC) between 1990 and 1995 (26 percent), the economy became *more* carbon intensive, increasing from 807 to 950 tons of carbon per million dollars of GDP (PPP).[29]

In contrast, carbon intensity is decreasing and is below its base year levels in all other EIT reform groups. Fast reformers — Czech Republic, Hungary, Poland, Estonia — have reduced their carbon intensity by 24–38 percent between their base years and 1996. Collectively, CEE countries reduced their carbon intensity by nearly 16 percent from 1990 to 1996. Much of this reduction can be attributed to sound reform measures in the energy sector and investments geared to reduce both air pollution and fuel use.

The Transition Reform

Energy Restructuring. Although future GHG emissions in EITs will be influenced by a variety of factors, energy restructuring is perhaps the most effective policy lever for altering emission trends and reducing carbon intensity. Energy sector reform is expected to increase energy efficiency and reduce waste both in the energy sector and the economy as a whole.[30]

The energy sector now figures centrally in the overall reform effort of the Annex I EITs. Common tendencies and priorities can be identified despite differences in approaches and levels of success in energy restructuring.[31] These common approaches include:

- **Commercialisation of Energy Generation.** One of the first steps in restructuring the energy sector is commercialising generation facilities and the fuel distribution network. This includes creating an institutional, legal and economic framework that will facilitate competition. Commonly used strategies to commercialise the energy sector and encourage competition include: [32]
  - decentralising heat generation and transferring district heating facilities to local governments (e.g. Hungary, the Czech Republic and Latvia);
  - breaking up the state monopoly in electricity generation and distribution and forming separate, often government-controlled companies (e.g., Poland, Hungary);
  - breaking up central mining companies into individual, autonomous entities (e.g., Poland).
- **Price Liberalisation.** Another strategy is the gradual and/or partial liberalisation of fuel, electricity and heat prices. Most EIT governments employ a combination of regulated price increases, restructuring, reduction and/or elimination of subsidies and liberalisation to adjust energy prices to approximate costs. It is difficult to reach conclusions about the level of liberalisation

because of the complex systems of cross-subsidies and the general lack of transparency in the cost structure of electricity, heat or fuel. However, most countries are gradually adjusting energy prices to eliminate cross-subsidies. For instance, Romania has been gradually increasing energy prices for residential consumers and adjusting commercial and industrial prices. The Romanian government has set the end of 1999 as a deadline for complete cross-subsidy removal.[33] In general, while CEE and NIS countries differ in the structure and degree of their energy-related subsidies and the fuels that they subsidise, over the last eight years they have radically increased (although not fully liberalised) energy prices.[34]

- **Privatisation.** Another element of the EIT reform strategies is the privatisation of energy sector components. Limited privatisation has occurred only in the fast reforming states (i.e., the Czech Republic and Hungary, underway in Bulgaria). Privatisation is a revenue-raising strategy as well as an instrument to attract strategic investors. One transitional and capital-mobilisation measure is to increase private capital's access to the gas and oil distribution network, new power generation facilities (independent power providers), or, where decentralisation has already occurred, to local and regional heat generation (e.g., Hungary and Latvia).[35] As a rule, electricity transmission grids remain public, as do the large electricity generation facilities. Access to generation is being opened to "independent producers" in some countries (Hungary, Poland and the Czech Republic) and individual generators have been sold to private companies.[36]

EITs combine and implement elements of these three strategies. Some encourage competition by breaking down the monopolies and liberalising prices, and then proceed to limited privatisation of energy sector components (Hungary, the Czech Republic). Other EITs proceed with privatisation before the energy monopolies have been dismantled (Bulgaria). Empirical evidence from both Western and Eastern Europe suggests that the trends of price liberalisation and competition, unleashed by breaking down the energy monopolies, are far more important than privatisation in providing incentives for efficiency and consequent emission reductions.[37] This is especially relevant in CEE and NIS, where privatisation does not necessarily mean improvement of corporate governance or investment in managerial skills.[38]

At present, EITs rarely assess energy reform strategies against criteria that integrate risk management, climate and development objectives. The Czech Republic seems to be the only Annex I EIT that has subjected its alternative energy sector strategies to a strategic environmental assessment along with a consideration of social and other implications.[39] The reverse is also true — few of the EIT climate mitigation studies are consistent with national economic development and environmental goals.[40]

Energy Efficiency. Many Annex I EITs have undertaken targeted programs and/or passed legislation designed to increase energy efficiency. Examples include: the National Energy Savings Action Plan approved by Hungary at the end of 1995, the Latvian National Energy Program, the Energy Saving Lighting Program of the Czech Republic, Kazakhstan's Law on Energy Savings and the energy efficiency provisions in the draft Bulgarian law on energy to be submitted to its parliament in 1999.[41] These measures are indicative of awareness that increasing energy efficiency is a low-cost way to improve environmental and economic performance. National governments, however, are not the most active institutions in promoting energy efficiency. Local governments, non-governmental organisations (NGOs) and private entities are undertaking lighting, energy conservation, renewable energy and other projects. One example of the private leadership of such a programs is the Efficient Lighting Project in Poland, financed by the Global Environmental Facility and the International Finance Corporation. In this project the private sector and NGOs collaborated in building demand and developing a consumer market for energy-efficient lighting.

Energy efficiency measures are often motivated by cost-reduction opportunities. Cost-reduction was the motivation for the street lighting retrofits in Rovno (Ukraine)

BOX 3

Factors Influencing Energy Sector Reform

Numerous factors influence energy reform in Annex I EITs. While some of these factors drive reform efforts, others inhibit them. Some of the more important factors that influence government decisions on energy restructuring include:

Social Factors and Political Risks: Governments try to avoid or limit the high social and political risks of energy sector reform. Social risks stem from increasing poverty and the loss of jobs in the reforms. These, along with the resistance of powerful domestic and international groups with high stakes in the energy reforms, create political risks for EIT governments, especially in Southeast Europe and the NIS.

Budget Deficits: The need to reduce budget deficits pushes governments to liberalise prices, remove subsidies and privatize energy sector components for revenue generation.

Security Concerns: Most governments, and many interest groups within countries, consider energy a strategic sector closely associated with national security. Thus, governments tend to: 1) maintain control over critical components of the energy system, 2) support and protect domestic fuel and energy generation, 3) limit dependence on single suppliers and 4) diversify or reduce reliance on imports.

Foreign Political Interests: In preparing for EU accession, 10 CEE countries in transition will have to meet a number of EU requirements which will have a mixed impact on GHG emissions. While coal sector restructuring is expected to reduce the carbon intensity of energy generation, the closing of nuclear facilities will increase some countries' dependence on coal.

and the district heating system modernisation in Chelyabinsk (Russia).[42] Another motivating factor for projects that reduce emissions is the reduction of local air pollution and associated health risks, defined as priorities by EITs' National or Local Environmental Action Plans and supported within the framework of the EAP for CEE. Under the umbrella of the EAP, a number of local energy efficiency, fuel conversion and other energy-related projects have environmental objectives with climate benefits. Examples include the European Bank for Reconstruction and Development-financed Thermal Energy Conservation Project in Romania; the Geothermal Energy Project in Pyrzyce, Poland, financed by the World Bank; and the United States-funded Coal-to-Gas-Conversion Project in Stara Zagora, Bulgaria. The primary objective of these projects is to reduce local air pollution and the associated health risks.[43]

Despite their cost-effectiveness and potential for co-benefits, there are no examples of large-scale energy efficiency projects in EITs. Most of the barriers that prevent such efficiency efforts are organically linked with the challenges of transition and the development choices that countries make.[44] For instance, perverse subsidies, unclear property rights and lack of information on benefits impede innovation and investment in energy efficient technologies and products. Investment and innovation is further thwarted by the weakness of potential investors — many of whom lack business experience, risk management knowledge and/or credit history and creditworthiness.[45] Greater rigor in clarifying property rights and disseminating information on benefits will remove some obstacles to investment, provide incentives for innovation and facilitate the implementation of energy efficient projects on a wider scale.

Planning for Compliance and Participation

Annex I EITs have undertaken specific measures to meet the objectives and requirements of the UNFCCC. These include Climate Action Plans, assessments of mitigation measures and options, participation in the Activities Implemented Jointly pilot phase and submissions of national communications. While non-binding in character, these efforts are nonetheless helpful preparation for the more stringent requirements of the Kyoto Protocol.

Climate Change Action Plans

Three CEE and NIS countries — Bulgaria, the Czech Republic and Ukraine — have already completed national Climate Change Action Plans. Hungary, Kazakhstan and Russia are preparing similar programs. These plans identify and prioritize measures that will help countries meet their commitments under the Convention and the Protocol. With these plans, countries seek to increase public awareness and support among decision-makers (Bulgaria, the Czech Republic, Kazakhstan, Russia), integrate climate policy into other development priorities (Bulgaria, Hungary, Kazakhstan) and increase domestic technological capacity (Bulgaria and Russia). Although objectives differ, four out of the six plans state that public awareness and building a constituency for action among government officials are priorities and necessary for successful climate initiatives.[46]

Climate Change Mitigation Assessments

Nine EITs, including Kazakhstan, have conducted global climate change mitigation assessments with assistance from the United States Country Studies Program.[47] The studies evaluate mitigation and adaptation response options and develop future emission scenarios. Many of these assessments, as well as the national Climate Change Action Plans, focus on mitigation and efficiency measures in the energy sector. The scenarios they offer clearly show that development choices in transition economies will determine whether emissions stay below, meet or exceed targets. Like Climate Change Action Plans, mitigation assessments typically rely on foreign support and are instrumental in helping EITs submit their national communications to the UNFCCC Secretariat.[48]

Institutional Arrangements

Several countries have developed institutional arrangements to guide climate-related policies and measures. These initiatives include working or other *ad hoc* groups as part of existing arrangements dealing with environment and development (e.g., the Hungarian Committee for Sustainable Development) or new multi-stakeholder institutions (e.g., the inter-ministerial working group on climate in Latvia, the inter-ministerial committees in Russia and Poland). Several ministries of the environment have also allocated staff time to oversee climate-related policies and measures.

These climate-focused institutional arrangements are positive steps which indicate that Annex I EITs are taking their obligations under the Climate Convention seriously. However, the current existing institutional infrastructure is weak and far from sufficient. In most cases, for instance, the climate-focused committees and working groups have an advisory rather than decision-making capacity.[49] Institutional capacity and staff resources in the ministries of the environment are also extremely limited and cannot fully support climate-related policies or the integration of climate objectives into development policies and priorities. Key decision-makers and the agencies that will ultimately need to implement many of the proposed measures (or integrate them into their restructuring programs) are rarely fully involved or informed. Sectoral pressures in these agencies, as well as lack of understanding of the opportunities and commitments, have created an unwillingness to cooperate.[50]

Learning through the AIJ Pilot Phase

Currently, most Annex I EITs are involved in Activities Implemented Jointly (AIJ), the pilot phase for joint implementation. AIJ was initiated in 1995 to help countries gain experience with joint implementation before it becomes operational under the Kyoto Protocol in 2008 (Article 6). Like joint implementation, AIJ involves *projects* that reduce GHG emissions or sequester carbon. Unlike joint implementation, however, there is no crediting for AIJ projects.

Table 3 indicates the distribution of AIJ projects in CEE and NIS countries.[51] Three Baltic states — Latvia, Estonia and Lithuania — host 49 of the 72 AIJ projects in the region funded by industrialised countries. Geographical disparity also extends to the investment aspect of AIJ, as the Scandinavian states, Germany and the United States have funded most AIJ projects. Table 4 shows the range of projects by type, with renewable energy (including co-generation) and energy efficiency projects being the most common.

Most EITs recognise the potential for AIJ to attract foreign investment in infrastructure. Toward this end,

TABLE 3

Distribution of AIJ Projects

Host Country	No. of Projects
Latvia	23
Estonia	18
Lithuania	8
Russia	8
Romania	4
Czech Republic	3
Hungary	3
Poland	3
Bulgaria	1
Slovenia	1
Total	**72**

Source: UNFCCC

TABLE 4

AIJ Projects (by Type)

Project Type	No. of Projects
Energy Efficiency	37
Renewable Energy	25
Fuel Switching	4
Fugitive Gas Capture	3
Afforestation	1
Forest Preservation	1
Reforestation	1
Total Projects	**72**

countries have undertaken a number of actions to build the institutional infrastructure necessary to support AIJ and the subsequent crediting phase of joint implementation under the Kyoto Protocol. These measures include:[52]

- identifying possible AIJ projects to facilitate implementation — for instance, the Polish JI Secretariat has compiled a list of over 65 potential AIJ/JI projects in Poland;
- establishing AIJ/JI project preparation units, secretariats or committees (Bulgaria, Poland, Slovakia and Russia);
- developing national criteria for the selection of AIJ/JI projects (Poland);
- developing national strategies for JI (the Czech Republic);
- earmarking funds to support AIJ and other activities and measures to reduce GHG emissions.

AIJ project experience is helping countries identify the legal and regulatory barriers that have deterred more widespread project implementation in CEE and NIS countries. For example, in Russia equipment certification for boilers is prohibitively time consuming and costly, prompting the Swedish AIJ investors to overlook Russia in its boiler conversion projects.[53] Many of the barriers that inhibit investment — including unclear property rights and conflicting institutional mandates — also impede innovation in the energy sector.

Unless the necessary institutional infrastructure is developed and barriers to investment are identified and addressed, EITs cannot expect to benefit widely from a crediting JI system under the Kyoto Protocol. Few countries in transition have special JI units or secretariats. Those JI bodies that do exist are relatively weak, do not have clear mandates and lack both transparent decision-making and the ability to link projects with the existing environmental funds. Clear government mandates about domestic AIJ/JI objectives (and project "eligibility" criteria that reflect these objectives) can reduce confusion and encourage project implementation consistent with national priorities.

Keeping Track: Reporting and Domestic Accounting

Countries with economies in transition already have some experience with measurement and reporting under the Climate Convention. Analysis of the national communications submitted under the Climate Convention reveals some capacity to measure and report emissions, as well as patterns that may present difficulties in the context of the expanded informational demands of the Kyoto Protocol.

Overall, CEE and NIS countries are taking their Climate Convention reporting responsibilities seriously and have submitted at least one national communication to the UNFCCC Secretariat. Many countries have submitted a second communication, as requested by the Parties to the Convention. Patterns that emerged in the national communication submissions include:

- All national communications were prepared with substantial participation from private, para-state and foreign organisations. In addition to government bodies, the main actors typically involved in preparing the communications include NGOs, private companies, universities and research institutes.[54] Most countries also relied on international financial assistance to compile emissions inventories. In Romania, for example, bilateral and multilateral cooperation from the United States Country Studies Program, Global Environment Facility/UNDP and the European Union's PHARE program on renewable energy have all contributed to the production of the national communication.
- As with other Annex I countries, the accuracy, transparency and verifiability of emission estimates and projections in CEE and NIS countries vary considerably.[55] The Estonian national communication, for example, notes that uncertainty over activity data could be as high as 25 percent. Measurement uncer-

tainties are compounded by sensitivity over energy data because of its close association with security concerns. This places further limitations on the availability of fuel data and increases information costs.

A combination of other factors, unique to CEE and NIS countries, complicates reporting and accounting of GHG emissions. First, many of the countries filing communications — including the Russian Federation, Ukraine, the Czech Republic, Slovakia and the Baltic countries — did not exist in their current geographic or political form during the "base year." Complicated backcasting studies are often required to determine the emission levels of sources or regions. Second, data often requires input from multiple government bodies. Radical government restructuring during the early 1990s altered the compositions and responsibilities of government ministries, making concerted efforts to gather data inherently difficult. Finally, economic collapse in the early 1990s de-prioritized the gathering of economic data and other national statistics in many countries. Adding to this difficulty is the fact that many governments are reluctant to re-launch extensive data collection efforts related to industry or commercial activity because of an aversion to state intrusion in the private sector and fear of being perceived as reverting to a command economy.

The consequences of these inherent difficulties and capacity deficits will become greater under the Kyoto Protocol. As outlined in Section I, the Kyoto Protocol expands the informational requirements (relative to the Climate Convention) that are needed to assess compliance with legal obligations. Transparent measuring, reporting and verification are the vehicles through which compliance must be demonstrated. All submissions relating to treaty compliance will be subject to increased scrutiny, and the "non-confrontational" review process under the Climate Convention will likely be strengthened to ensure the environmental integrity of the Protocol.[56] The review process under the Kyoto Protocol (outlined in Article 8) will, at a minimum, need to "provide a thorough and comprehensive technical assessment of all aspects" of a Party's implementation of the Protocol.

Clearing the Hurdles

While Annex I economies in transition have undertaken multiple measures to address climate change, the expanded demands and requirements of the Kyoto Protocol constitute formidable challenges. The lack of institutional capacity and a shortage of human and financial resources in EITs raises the height of these hurdles considerably relative to other Annex I countries. Successfully clearing the hurdles of treaty implementation — and realising the associated benefits of climate protection — will require new policy frameworks, continued institutional development and improved capacity, a strong constituency for climate change and political and financial stability. The general recommendations outlined below may be useful for national governments undertaking reforms, multilateral development banks, the UNFCCC Secretariat, NGOs and industrialised country governments.

Creating the Policy Frameworks

Implementing a binding legal instrument like the Kyoto Protocol will require a new set of policies and regulatory arrangements in CEE and NIS countries. Domestically, a framework could take a variety of forms, such as establishing performance standards or emission limits for sources. Countries could implement tax, subsidy or other public policies to help ensure compliance. For the most part countries lack experience with these types of regulatory frameworks, particularly in the context of achieving improved environmental performance. The overall lack of experience with market-based environmental policy and the historical preference for command-and-control measures may inhibit private and public institutions' ability to learn and use a new framework and may be an obstacle to treaty implementation.

Although there have been some preliminary experiments — Hungary and Poland have experimented with demonstration projects and are considering SO_2 emission trades[57] — regulatory experience is particularly lacking for emissions trading. At a minimum, new rules and procedures are required for governments to make public all information regarding trades; prices of emission reductions or PAA; status of legal entities participating in monitoring, reporting, verification and other related concerns.

It should be noted that these institutional deficits are not particular to countries with economies in transition. The mechanisms created by the Kyoto Protocol are beyond the scope and complexity of any environmental regulatory policy ever implemented, *even in advanced market economies*. However, since EIT countries are now developing markets and reshaping public institutions, they face a steeper learning curve and have greater needs relative to other Annex I countries with experienced market economies. New regulatory frameworks will help lower transaction costs, remove investment barriers and encourage the implementation of GHG-reducing projects with climate and development benefits.

CEE and NIS countries have undertaken energy sector reforms (including partial privatisation of the sector) as a strategy to raise revenues, reduce the burden on the state budget and attract investment. However, reform efforts are far from complete. A combination of factors — such as unclear property rights, distorted prices and subsidies, public ownership and/or strong government control over emitting sources — provides little incentive for technological innovation and makes energy efficiency measures unattractive to energy generators and transmitters. The commercialisation strategies already implemented by CEE and NIS countries may, in the future, meet some of these requirements if supported by clear mandates and property rights and linked to a system of incentives.

Overall, the reform process will trigger solutions to key governance issues, which is particularly important for the CEE countries aspiring to join the European Union. EU member states will be reluctant to admit countries that lack effective institutional and environment policy frameworks. This is particularly true in the case of climate policy, as the European Union is aiming to implement the Kyoto Protocol under a joint framework (as a regional economic integration organisation).

RECOMMENDATIONS

- **Build practical experience with market-based environmental policies.** EIT and other Annex I governments should explore the opportunities for participation in pilot trading programs, as well as for developing smaller scale domestic programs. Further practical experience can be gained through the AIJ pilot phase.
- **Identify and address issues that hinder project investment and implementation.** Industrialised Annex I countries should pursue a more geographically diverse distribution of climate-friendly projects and assistance in building AIJ/JI institutional infrastructure in all Annex I EITs.
- **Implement sectoral reforms with a climate strategy.** Multilateral development banks, EIT governments and civil societies should actively promote a strategy of mainstreaming climate considerations into sectoral reforms. Such a strategy will help save energy costs, address local environmental problems and associated

health risks and improve governance capacity. It can also help countries attract additional bilateral and multilateral financial resources and assistance for either climate-related programs or other reform measures that reinforce multiple domestic objectives.

Improving the Institutional Infrastructure

Implementing the Kyoto Protocol goes beyond developing new regulatory frameworks. In many cases governments will need to either create a new national agency, re-scope existing institutional mandates or build outsourcing arrangements and support private organisations.

EIT countries will have to develop "national systems" for measurement and reporting, which are not currently in place. In Hungary and other countries, for example, "relevant government institutions carry out the inventories on an *ad hoc* basis rather than as a regular activity."[58] Given the institutional and financial challenges associated with reporting, many of the functions for producing national reports or for measurement and verification are likely to continue to be outsourced. Such outsourcing can help maximize the comparative strengths of different national institutions in the effort to gather data and report. However, a "national system" will require outsourcing arrangements that are supported by performance requirements, licensing, certification or other methods sanctioned by authorities. Mandates, responsibilities and lines of communication must be clarified for the many NGOs, government agencies, research institutes and other entities that are entrusted with measurement and reporting responsibilities. Participating entities will also need to remain up-to-date on evolving standards, methodologies and reporting formats. A more coordinated, government-led effort would include: institutional arrangements for inventory preparation, procedures for collecting activity data and developing appropriate emission factors and procedures for internal and external verification of estimates.

Government bodies must also vest authority in local and/or national institutions (including the private sector) to negotiate with foreign entities and to make decisions related to project investment. Many investing countries claim that there is often no clear legal entity (government or private) to negotiate with when investigating potential GHG-reducing projects. Residential heating projects in the Baltic states, for example, often lacked a clear legal entity with the authority to contract (on behalf of tenants) or negotiate with investors. Similarly, lines of communication, authority and responsibility must be clarified for the "credit sharing" negotiations of AIJ/JI projects. Because of the implications for treaty compliance, national decision-making will need to be involved at some level.

New communication needs will also require new institutional capacity. Computerisation capacity may be needed to automate transactions and coordinate information, such as any change in a Party's assigned amount, with the UNFCCC Secretariat or other authorised central body. Governments and non-state stakeholders also need to develop and implement disclosure policies to facilitate access to information by multiple users for multiple purposes.

RECOMMENDATIONS

- **Build capacity by developing replicable models.** EIT governments, NGOs and other private actors need to identify and address institutional capacity deficits. Annex I countries should collaborate in developing replicable models and systems to address such deficits.
- **Disseminate success.** Regional institutions, NGOs and other actors involved in climate-related initiatives in EITs should invest in the dissemination and replication of successful institutional and policy initiatives. Such dissemination will help countries build on positive developments and provide information about possible approaches to strengthen compliance, facilitate participation in the Kyoto mechanisms and combine development and climate objectives. Other Annex I countries should actively assist in such dissemination.
- **Design realistic implementation rules.** In shaping the implementation rules and mechanisms for the climate treaty and the Kyoto Protocol, the international community needs to take into account institutional and policy realities in all Annex I countries. The on-going discussion of these rules should take into account the special needs of the countries with economies in transition. The CEE and NIS countries should also assess and identify key policy and institutional issues that will help them implement their commitments and contribute to shaping the international rules under the Protocol.

Building a Constituency for Climate

The majority of the countries that have or are developing Climate Change Action Plans indicate that building a constituency for climate action among both the public and government agencies should be a priority. Mobilising widespread support for government action on climate issues is critical because in most cases climate ranks low on EIT government agendas. Governments are in a position to prioritize action, and unless public support is strong for climate change this issue will likely remain in the periphery of government decision-making. A broader constituency for climate issues can help push climate action higher on government agendas as well as promote linkages between climate objectives and other development and environmental policy goals.

RECOMMENDATION

- **Increase awareness and build constituencies.** NGOs and other private institutions currently involved in climate issues should broaden their reach and work more actively to influence and inform constituencies (both the public and the government) as well as to promote the linkages between climate and other environmental and market policies. The donor community should support such efforts in EIT countries.

Addressing Political and Financial Stability

Some countries, such as the Russian Federation, Ukraine and Annex I countries in Southeast Europe, have not successfully emerged from transition. Regional conflicts, crippling fiscal deficits and foreign debt, coupled with unemployment, inflation and social unrest, make climate strategies an extremely low domestic priority. All these factors slow or even freeze reform — and impede the inclusion of climate objectives in reform efforts being undertaken. Furthermore, political and economic turmoil creates profound investment risks that will prevent successful international cooperation through joint implementation and emissions trading.

Deregulation, privatisation and removal of subsidies usually have huge and immediate impacts on price levels and often come only at substantial social cost. Unless these costs are addressed, stability is unlikely. One positive example is in the Czech Republic, where the gradual elimination of heating subsidies has been proposed *in concert with* social support programs targeted at individual households.[59]

RECOMMENDATION

- **Address the social and political risks of reform.** Where possible, governments and multilateral development banks should work to couple potentially destabilizing reform measures with support programs that address specific social and economic uncertainties.

Endnotes

1 Refers to the countries listed in Annex I of the United Nations Framework Convention on Climate Change. In addition to the countries listed in Table 1, Western Europe (including the European Union), the US, Canada, Japan, Australia and New Zealand are included in Annex I.

2 FCCC/CP/1998/11/Add.2. 5 October 1998. Table B.15. Data represents total anthropogenic emissions of main GHGs (CO_2, CH_4 and N_2O) excluding land use change and forestry. *Exceptions:* 1995 data was not available for Russia (where 1994 was used), Poland (also 1994) and Romania (1993). Data for Lithuania, Romania and the Ukraine is *carbon dioxide only*. Emissions for Romania are derived from the first national communication: *First National Communication Concerning the National Process of Applying the Provisions of the Framework Convention on Climatic Changes*, January 1995. Lithuania's base year emissions are also derived from the first communication to the UNFCCC: *First National Communication of the Republic of Lithuania on Climate.* The Ukraine's base year emissions are from the *Draft Ukrainian National Action Plan on Climate Change*, 1998, Agency for Rational Energy Use and Ecology, US Country Studies Program, Country Study on Climate Change in Ukraine. Kyiv. 1995 emissions for both Lithuania and Ukraine are from G. Marland, T. Boden and A. Brenkert, January 1999, *National CO_2 Emissions from Fossil Fuel Burning and Cement Manufacture, and Gas Flaring: 1751-1996*, Preliminary Data, Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory. Where necessary, data has been converted to millions of metric tons of carbon equivalent.

3 Carbon emissions for these four countries totalled 223.5 million metric tons (MtC) during the respective base years (including the Hungarian average base year), while 1990 emissions totalled 175.1 MtC — a difference of 21.7 percent. Marland et al., 1999.

4 List of Project Preparation Committee Projects. Presented for information at the Joint Session of the PPC/Task Force, February, 25 1997; *PPC Report to the Fourth Ministerial Conference "Environment for Europe" in Aarhus*, June 23-25, 1998.

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12 Article 2 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

13 Jan Corfee Morlot, 1998.

14 The Intergovernmental Panel on Climate Change (IPCC) was established jointly in 1988 by the World Meteorological Association and the United Nations Environment Programme. The IPCC provides advice to the Conference of the Parties and the Convention's subsidiary bodies on scientific and technical issues.

15 Jan Corfee Morlot, 1998. p. 22.

16 See Article 12 of the United Nations Framework Convention on Climate Change.

17 Jan Corfee Morlot, 1998.

18 For a complete discussion of this topic, see Fiona Mullins, 1998.

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26 Figure 2 is derived from Marland et al, 1999 (carbon emissions data); The World Bank, *World Development Indicators CD-ROM*, 1998 (GDP data); and national communications to the UNFCCC secretariat.

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eration, February 1997, UNFCCC, FCCC/IDR.1/RUS. GDP data is from the World Bank, *World Development Indicators CD-ROM*, 1998.

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31 *Financing Private Infrastructure: Lessons of Experience,* International Finance Corporation, 1996*; Foreign Direct Investment: Lessons of Experience,* International Finance Corporation, 1996; see also *Transition Report 1997*, EBRD, 1998.

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World Resources Institute

The World Resources Institute (WRI) is an independent center for policy research and technical assistance on global environmental and development issues. WRI's mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations.

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The Institute's current areas of work include economics, forests, biodiversity, climate change, energy, sustainable agriculture, resource and environmental information, trade, technology, national strategies for environmental and resource management, business liaison and human health.

In all of its policy research and work with institutions, WRI tries to build bridges between ideas and action, meshing the insights of scientific research, economic and institutional analyses and practical experience with the need for open and participatory decision-making.

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THE REGIONAL ENVIRONMENTAL CENTER FOR CENTRAL AND EASTERN EUROPE (REC) is a non-partisan, non-advocacy, not-for-profit organisation with a mission to assist in solving environmental problems in Central and Eastern Europe (CEE). The Center fulfils this mission by encouraging cooperation among non-governmental organisations, governments, businesses and other environmental stakeholders, by supporting the free exchange of information and by promoting public participation in environmental decision-making.

The REC was established in 1990 by the United States, the European Commission and Hungary. Today, the REC is legally based on a Charter signed by the governments of 25 countries and the European Commission, and on an International Agreement with the Government of Hungary. The REC has its headquarters in Szentendre, Hungary, and local offices in each of its 15 beneficiary CEE countries which are: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, FYR Macedonia, Poland, Romania, Slovakia, Slovenia and Yugoslavia.

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WRI-REC PARTNERSHIP The Regional Environmental Center for Central and Eastern Europe and the World Resources Institute have formed a partnership to assist Central and Eastern Europe and the New Independent States in reforming their policies and institutions to comply with commitments and respond to opportunities for infrastructure development created by the Framework Convention on Climate Change and the Kyoto Protocol.

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