



**INDUSTRY JOINT SEMINAR ON TECHNOLOGY
DIFFUSION IN EASTERN EUROPE AND
CENTRAL ASIA:
28-29 OCTOBER 2003**

The Industry Joint Seminar on Technology Diffusion in Eastern Europe and Central Asia took place from 28-29 October 2003 at the Vienna International Center, Austria. The seminar was organized by the Climate Technology Initiative (CTI) and the UN Industrial Development Organization (UNIDO), in cooperation with the Secretariat of the UN Framework Convention on Climate Change (UNFCCC) and Austria's Ministry of Economics and Labor. It was attended by 105 representatives of governments, intergovernmental organizations, non-governmental organizations (NGOs), business and industry groups, and academic institutions.

The objectives of the seminar were to increase participants' awareness of climate change and technology transfer issues, review experiences in Central and Eastern Europe and in Central Asia, and promote the development of environmentally-sound projects by encouraging collaboration between policymakers, technology transfer specialists, financial institutions, and the private sector.

On Tuesday, 28 October, participants met in two plenary sessions to hear presentations and engage in discussions on the status of technology transfer under the UNFCCC, and on technology transfer under the Kyoto Protocol. A panel discussion on the role of OECD countries in diffusing technology in the target regions was also convened. Two regional presentation sessions, focusing on experiences in OECD countries and in Central and Eastern Europe and Central Asia, were held on Tuesday morning and afternoon, and on Wednesday morning. On Wednesday afternoon, participants convened in a panel discussion on financial barriers and the role of multilateral and financial organizations.

The meeting is expected to result in further dialogue and cooperation among key stakeholders on the diffusion of environmentally-sound technologies in Central and Eastern Europe and Central Asia.

**A BRIEF HISTORY OF THE UNFCCC AND
TECHNOLOGY TRANSFER**

Climate change is considered one of the most serious threats to the world's environment, with negative impacts expected on human health, food security, economic activity, water and other natural resources, and physical infrastructure. Global climate varies naturally, but scientists agree that rising concentrations of anthropogenic green-

house gas (GHG) emissions in the Earth's atmosphere are leading to changes in the climate. According to the Intergovernmental Panel on Climate Change, the effects of climate change have already been observed. Despite some lingering uncertainties, the majority of climate scientists believe that prompt and precautionary action is necessary.

The international political response to climate change began with the UNFCCC. Adopted in 1992, the UNFCCC sets out a framework for action aimed at stabilizing atmospheric concentrations of GHGs to avoid "dangerous anthropogenic interference" with the climate system. The GHGs to be limited include methane, nitrous oxide, and, in particular, carbon dioxide. The UNFCCC entered into force on 21 March 1994. It currently has 188 Parties.

TECHNOLOGY TRANSFER: Technology transfer is considered a key element in combating climate change under the UNFCCC. Technology transfer activities have been on the agenda of every session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Conference of the Parties (COP). UNFCCC Article 4.5, which addresses the need for technology transfer, states that "developed country Parties ... shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally-sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention," adding that "in this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties."

At COP-7, held in October-November 2001, Parties adopted decision 4/CP.7, which establishes a framework for meaningful and effective actions to enhance the implementation of UNFCCC Article 4.5, and consists of five key components: technology needs assessments; technology information; enabling environments; capacity building; and mechanisms for technology transfer. Decision 4/CP.7 also establishes an Expert Group on Technology Transfer (EGTT).

At SBSTA-16, held in June 2002, Parties adopted the 2002-2003 work programme of the EGTT, which focused on enabling environments for the transfer of environmentally-sound technologies. The SBSTA asked the EGTT to take into account Parties' views and relevant IPCC reports in implementing its work, and requested a brief progress report at SBSTA-17. SBSTA-16 also requested the Secretariat to: initiate an outreach programme to make its technology information system available to the public; update and maintain the

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system; assess the system's effectiveness and report on it at SBSTA-19; and cooperate with the Global Environment Facility (GEF), United Nations Development Programme (UNDP), and other relevant organizations and initiatives to develop a simplified handbook on methodologies for technology needs assessments, and report back on these to SBSTA-18.

At SBSTA-17 in October 2002, Parties agreed to a decision requesting the SBSTA Chair to conduct consultations and ensure collaboration among expert groups on cross-cutting issues of their work programmes, including issues relating to technology transfer and capacity building. SBSTA-17 also called on SBSTA-19 to consider innovative ways of addressing the outcomes of the technology needs assessments under the EGTT work programme. It urged developed country Parties to continue providing support to developing country Parties, noted several initiatives on technology transfer, and requested the Secretariat to prepare a technical paper and organize a workshop on enabling environments for technology transfer.

At SBSTA-18 in June 2003, participants adopted conclusions requesting the EGTT to consider including the development of environmentally-sound technologies in its work activities, consider the outcomes of the workshop on synergies, and recommend further actions to SBSTA. SBSTA-18 also requested the Secretariat to organize senior-level round-table discussions between governments, business and industry at COP-9, and asked for a special meeting of the EGTT in conjunction with the technology events planned by the Government of India in November 2003. It also requested a continuation of work to develop links with relevant technology information systems and clearing houses, and existing national and regional technology centers, as a way of showcasing potential opportunities for technology transfer identified through Parties' technology needs assessments.

REPORT OF THE SEMINAR

Herwig Dürr, Director of Foreign Economic Policy and European Integration with Austria's Federal Ministry for Economic Affairs and Labor, welcomed participants and stressed Austria's close relations with Central and Eastern Europe and with Central Asia, the target regions for this seminar. He underlined Austria's high environmental standards relating to industry and noted that the Austrian Government spends around three percent of its Gross Domestic Product (GDP) on environmental issues. He expressed the hope that this seminar would facilitate the promotion of technology transfer.

Haruko Hirose, Managing Director, Programme Coordination and Field Operations Division, UNIDO, noted that this seminar had brought together representatives of governments, the private sector and academia to discuss GHG mitigating technologies. She underlined the importance of countries' case studies on successes and problems encountered in addressing climate change, and pointed to UNIDO's work in the target regions, which focuses on supporting long-term sustainable development and assisting countries in these regions in meeting their employment and economic objectives. Hirose noted UNIDO's support for the Kyoto Protocol through projects on energy efficiency and renewable energy in industrial technologies. She indicated that this seminar would discuss recommendations to establish a set of activities aimed at fostering technology transfer to the target regions. She stressed UNIDO's desire to encourage and assist industries to partake in the Kyoto Protocol mechanisms, including the Clean Development Mechanism (CDM) and Joint Implementation (JI).

Shigetaka Seki, Executive Committee Chair, Climate Technology Initiative (CTI), Japan, explained that CTI was established in 1995 as an OECD initiative to facilitate technology transfer to address climate change, adding that CTI facilitates interactions between the public and private sectors to identify technology needs. Noting the usefulness of sharing experiences, he expressed hope that participants would return to their countries after the meeting with new ideas for promoting energy efficiency and technology transfer.

SESSION ONE: STATUS OF TECHNOLOGY TRANSFER UNDER THE UNFCCC

In this session, chaired by Shigetaka Seki on Tuesday, 28 October, participants heard two presentations on the status of technology transfer under the UNFCCC.

Daniele Violetti, Programme Officer, UNFCCC, outlined developments made in considering technology transfer under the UNFCCC. He drew attention to: the UNFCCC workshop on enabling environments for technology transfer held in April 2003; the technology information system TT: CLEAR; a technical paper on capacity building for technology transfer that was being prepared in time for SBSTA-19; and the handbook on methodologies for technology needs assessments. He reported that the technical paper resulting from the UNFCCC workshop in April 2003 on enabling environments had identified several key factors for successful technology transfer, including undertaking social impact assessments, strengthening regulatory frameworks, considering the role of local communities and circumstances, and involving industry in the design of regulations and enforcement mechanisms. He outlined the future activities of the EGTT, and stressed that the development of new technologies and possible targets on the use of renewable energy sources could play a critical role in future discussions under the UNFCCC.

Vute Wangwacharakul, EGTT, said the EGTT's mandate is to analyze and identify ways of facilitating and advancing technology transfer activities and to provide relevant advice to SBSTA. He explained that the EGTT had completed the elaboration of its five-year work programme, organized regional and international workshops, and provided recommendations to SBSTA on initial activities on technology needs assessments and capacity building. He said that, pending SBSTA's approval of its programme of work, the EGTT will continue working on technology needs assessments and enabling environments, analyze ways to strengthen the effectiveness of TT: CLEAR, complete its analysis of capacity building, and further consider mechanisms for technology transfer.

SESSION TWO: TECHNOLOGY TRANSFER AND THE KYOTO PROTOCOL

In this session, which was chaired by Vute Wangwacharakul, participants heard five presentations and engaged in discussions on technology transfer in relation to the Kyoto Protocol.

PRESENTATIONS: Morihiro Kurushima, Programme Manager, CTI, outlined CTI's activities on technology transfer, including seminars and symposia, technology needs assessments, training courses and information dissemination. Noting CTI's ongoing programme of seminars and workshops, he said CTI supports the UNFCCC process and facilitates the diffusion of climate-friendly and environmentally-sound technologies and practices. Kurushima observed that CTI helps coordinate the activities of governments, academia and the financial sector in

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order to assist in project development and implementation. He illustrated successful CTI initiatives carried out in Mexico, Thailand and Mauritius relating to energy efficiency and renewable energy sources.

Herwig Dürr noted that Austria has a large amount of renewable energy sources and aims to export its environmentally-sound technologies. Highlighting Austria's support of numerous initiatives relating to technology transfer, he underscored the importance of organizing workshops and ensuring information flow to the private and public sectors. He observed that the Austrian Parliament had approved the Austrian Joint Implementation Programme under the Kyoto Protocol, which will function as a tool for technology transfer in the target regions.

Peter Pembleton, Multilateral Environmental Agreements Branch, UNIDO, explained that UNIDO mobilizes national and regional capacity, and develops mechanisms that support industry under the UNFCCC and Kyoto Protocol. He indicated that UNIDO had identified the need for improvements in information dissemination and awareness raising, technical advisory services, legal and regulatory environments, economic frameworks, institutional support, and the flow of foreign direct investment and finance. He reported that proposals for such improvements include: harmonizing policies; removing import duties and taxes on imported technologies; and reducing and simplifying investment approvals, procedures and license fees.

Cahit Gurkok, Energy and Cleaner Production Branch, UNIDO, explained that the Branch promotes energy policies, including those policies dealing with industrial energy efficiency and renewable energy technologies. He stressed the importance of establishing income-generating activities to maintain the sustainability of energy supplies. On the issue of cleaner production and waste management, he informed participants that the Energy and Cleaner Production Branch focuses on reducing environmental impacts and on improving industrial performance by increasing process management and enhancing competitiveness.

Victor Zakharian, Field Coordination and Resource Mobilization Branch, UNIDO, explained that this Branch transmits industrial investment and technology to countries requiring assistance, and provides opportunities for investors and technology suppliers to enter into partnerships with developing countries and countries with economies in transition to a market economy (EITs). He referred to UNIDO's investment and technology promotion network, and stressed that UNIDO can promote CDM projects in non-Annex I countries by selecting appropriate projects and identifying potential investors.

Ferda Gelegen, UNIDO Investment and Technology Promotion Office (ITPO) Tokyo, Japan, noted that his organization's major activities include country and technology seminars, technology transfer, and regional programmes. He outlined the organization's recent climate change activities, including organizing the International Forum in Tokyo and the 13th Asia Pacific Seminar on Climate Change, and developing the CDM Delegate programme. Gelegen highlighted the importance of providing relevant information to investors and engaging in effective CDM project design.

DISCUSSION: Following the presentations, participants discussed UNIDO's support for small-scale as opposed to large-scale projects, and agreed on the importance of improved communication between governments, the private sector and investors.

SESSION THREE: REGIONAL PRESENTATIONS - OECD

This session was chaired by Morihiro Kurushima, with Helmut Berger acting as rapporteur. Participants heard nine presentations on the role of OECD countries in technology transfer.

PRESENTATIONS: Konrad Autengruber, Head of Business Development, VA Tech Hydro, Austria, outlined a JI project on renewable energy sources in Bulgaria. He said that the project mitigates GHG emissions in Bulgaria by shifting energy generation from coal to hydro-power facilities. Autengruber explained that the Austrian and Bulgarian governments entered into a bilateral contract, which established the project's specifications, including distribution of credits. He outlined the basic steps for preparing a JI project, including the project idea note, project design document, baseline study, validation and monitoring, memorandum of understanding for preferred project categories, strategy to utilize the generated certificates, environmental impact assessment report, and results of the stakeholder process.

John Topper, Managing Director of the International Energy Agency (IEA) Clean Coal Centre, UK, and IEA Environmental Projects Ltd., France, presented on coal and fossil fuels "en route" to a carbon-constrained future. He noted a projected increase of 55% in the world's primary energy demand between 2000 and 2030, and stressed that energy demand is increasing in developing countries. Topper recommended that policies should: support research and development; create a long-term policy framework to promote clean technologies, especially clean coal technologies in non-OECD countries; and evaluate the storage of carbon dioxide. He highlighted that coal and fossil fuel consumption can be expected to increase in light of the high industrial activity in EITs, and due to increasing electricity use in developing countries. He concluded that fossil fuels are likely to be a transitional source of energy supply towards a "hydrogen economy."

Daniel Droste, MVV Consultants and Engineers, Germany, outlined the role of the EC Energy Centers, explaining that they support energy efficiency in the Commonwealth of the Independent States (CIS) by: advising EU authorities; influencing local energy legislation and energy sector developments; undertaking technical demonstration projects on energy efficiency; and training experts. He said that as a consequence of local conditions in the Russian Federation during the 1990s, the EC Energy Centers had focused their efforts on energy-intensive industrial branches, adopted low-cost and no-cost technical improvements, and lobbied for higher energy prices and a customer-oriented business approach. He stressed the importance of undertaking demonstration projects to show that the Kyoto mechanisms are operational.

Pim Kieskamp, Senior Expert on Sustainable Energy and Climate Change, Climate Business Network, the Netherlands, informed delegates that EU initiatives on renewable energy technology include setting policies and targets, developing market mechanisms, and fostering research, development and demonstration of technologies. He outlined several EU programmes on energy efficiency, alternative renewable energy systems, sustainable transport, and cooperation with developing countries to promote energy efficiency for poverty alleviation. He reported that most EU programmes promote sustainable energy communities, adopt an approach of "thinking globally and acting locally," foster financing mechanisms and incentives, and carry out monitoring and evaluation activities. He noted that the EU offers funding to promote research, development and capacity-building programmes.

Jan-Willem van de Ven, European Bank for Reconstruction and Development (EBRD), noted the clear relationship between the advanced transitional stage towards a market economy, and decreased energy intensity. He said that barriers to increased energy efficiency include: low energy prices; lack of energy subsidy reforms; the relatively small size of energy conservation investments; and public authorities' low prioritization of energy conservation. He stressed that policy

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changes necessary to remedy “market failures” include setting energy tariffs at cost recovery level, removing energy subsidies, enforcing hard-budget constraints, and internalizing the external costs of conventional energy. He said that the EBRD’s role in carbon financing is to procure carbon credits on behalf of buyers, assist buyers to identify appropriate sellers, monetize carbon credits by lending against them, and enhance the credit worthiness of sellers if deemed too low by buyers.

Junichi Nakazawa, General Manager of the Moscow Office of Sumimoto Corporation, Japan, explained that Sumimoto’s JI and CDM projects reduce GHG emissions and increase energy efficiency in oil refineries and power stations, and reduce fugitive methane emissions through gas pipeline maintenance and repair. He outlined a JI project in the Russian Federation, under which Sumimoto Corporation maintains and repairs gas pipeline systems to decrease gas leakage, and implements devices to prevent gas-related accidents. He said the project’s purposes include: reducing GHG emissions from gas pipelines; modernizing gas transport systems; and stimulating economic growth in the Russian Federation. Nakazawa outlined a CDM project in China, in which Sumimoto collects methane from coal mines to be utilized for power generation at the mines.

Sumie Nakayama, Manager of the Corporate Planning and Administration Department, J-Power, Japan, explained that J-Power acts as an owner of certified emissions reductions (CERs) by developing and investing in CDM projects on landfill gas capture, destruction of hydrofluorocarbons, ruminant methane reduction, biomass power generation, and energy efficiency. She noted that J-Power also acts as a CERs buyer in the emissions trading market and through participation in CDM projects. Noting that Japanese companies will face difficulties in trading acquired CERs and emission reduction units (ERUs) if the Kyoto Protocol fails to enter into force, Nakayama stressed the importance of an international emissions trading market.

Naohito Soma, Manager of the Nippon Steel Corporation, Japan, presented a paper on his company’s energy saving and GHG mitigating technologies. He outlined his company’s voluntary action plan to achieve a 10% reduction of energy consumption in production processes for the period from 1990 to 2010. Soma observed that the Nippon Steel Corporation promotes recycling by establishing measures for the re-utilization of resources, waste management and energy saving programmes for local communities.

Aimee McKane, Programme Manager with the Lawrence Berkeley National Laboratory in the US, pointed out that most industries do not realize energy savings in their manufacturing systems because they focus on production and overlook opportunities relating to energy efficiency. McKane noted that, since 1992, the US Department of Energy has worked with the energy industry to, *inter alia*: demonstrate the links between energy efficiency, system reliability and lower operating costs; and develop new educational material for energy savings. She stated that US energy programmes aim at increasing public-private partnerships, carrying out plant assessments, and assessing energy saving opportunities.

DISCUSSION: Participants discussed the use of fast-track approaches in carrying out CDM and JI projects, and stressed the importance of increased flexibility in designing such projects. They also debated the details of pricing of CERs and ERUs and the profitability of energy savings.

SESSION FOUR: PANEL DISCUSSION ON THE ROLE OF OECD COUNTRIES IN TECHNOLOGY DIFFUSION IN EASTERN EUROPE AND CENTRAL ASIA

This session was chaired by Guillermo Jimenez, UNIDO, with Helmut Berger acting as rapporteur. The four panelists discussing this issue with participants were Konrad Autengruber, Daniel Droste, Pim Kieskamp, and Morihoro Kurushima.

Panelist Pim Kieskamp, Senior Expert on Sustainable Energy and Climate Change, Climate Business Network, the Netherlands, stressed the importance of involving stakeholders, including the private sector, from the beginning to the end of a project cycle in order to implement CDM and JI projects successfully. Several participants noted that capacity building is a crucial component of any technology transfer project, but observed that other issues such as promoting financial flows and understanding the Kyoto mechanisms must also be addressed.

Panelist Konrad Autengruber, Head of Business Development, VA Tech Hydro, Austria, observed that factors considered by the private sector in evaluating technology transfer projects include project feasibility, risk avoidance, and identification of financial sources. He suggested that technologies transferred cannot be the most recent ones because projects rely on well-tested technologies that may work in recipient countries. He underscored the importance of political willingness and social standards for implementing JI projects, and suggested that capacity building and enabling environment activities be carried out in preparation for private sector investments. Responding to these comments, one participant noted that capacity must be built in recipient and donor countries, and another said there is a need to reduce project transaction costs.

Several participants discussed the concept of “additionality” under the UNFCCC relating to technology transfer, noting that countries may set their own criteria of what constitutes additionality. One participant noted the difficulty of securing funding for technological innovations, and another highlighted that major barriers to investment include higher investment costs of new technologies, and unfavorable external conditions, such as political instability.

Panelist Daniel Droste, Senior Consultant, MVB Consultants & Engineers, Germany, drew attention to the high cost of educating those involved in implementing new technologies, including custom officers, project design institutes, certification bodies, and operating staff.

Panelist George Abulashvili, Director of the Energy Efficiency Centre, Georgia, stressed the importance of increasing public awareness of new technologies, and of involving civil society in implementing modern energy technologies.

SESSION FIVE: REGIONAL PRESENTATIONS – CENTRAL AND EASTERN EUROPE, AND CENTRAL ASIA

This session, which took place on Wednesday, 29 October, consisted of panel discussions on the Central and Eastern Europe, Central Asia and Transcaucasian regions. All panels were chaired by Gaudenz Assenza, Senior Lecturer at Palacky University, Czech Republic. Sergei Levchenko, National Academy of Sciences of Belarus, acted as rapporteur.

CENTRAL AND EASTERN EUROPE PANEL: Providing an overview of the topic, Gaudenz Assenza focused on the Ukraine as an instructive case study. He explained that the Ukraine is one of the world’s most energy inefficient countries, with an energy intensity twice as high as its transition neighbors and the highest emissions for its GDP among CIS countries. He identified various reasons for this, including its inheritance of outdated Soviet technology and subsidized

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energy prices. Noting that the market for energy efficiency is growing, he stressed that NGO participation enhances the success of energy efficiency projects. He identified several significant barriers, including uncertainty in the business environment, weak legal environments, lack of enforcement, and outdated policies. Assenza noted that high energy tariffs had resulted in non-payment of energy bills, and drew attention to inefficiencies and barriers in the energy sector, which affect investments in the region. He suggested that responses to these problems could include improved banking, private investment, currency stability, a sound regulatory regime, transparency and co-financing. He also observed that the region has many unexploited opportunities for improving energy efficiency on both the supply and demand sides.

Sergei Levchenko outlined the electricity chain facilities and least-cost expansion plans for Belarus' electricity generation system. He pointed out the need to increase investment and renew the capacity for energy generation. Observing that Belarus is assessing whether to use nuclear power, Levchenko stated that biomass is the only feasible alternative energy source for Belarus. On mitigating GHG emissions, he concluded that Belarus could: improve the decision-making process; increase energy efficiency; replace old power capacity by combining cycle units and nuclear power plants; and use clean and contaminated wood waste fuel to replace imported fuel.

Nikolay Nikolov, Head Expert on Programmes and Projects, Ministry of Energy and Energy Resources, Bulgaria, noted that the energy sector is the main source of GHG emissions in Bulgaria. He indicated that his Ministry is seeking to increase energy efficiency and the share of renewable energy sources by: increasing existing incentives for combined heat and power plants and fostering the use of other renewable energy sources; establishing an energy efficiency fund to overcome financial barriers for project implementation; attracting foreign investment; and raising civil society awareness on climate change problems and mitigation measures.

Lidia Trescilo, Member of the National UNFCCC Working Group, Moldova, noted that Moldova's challenges relating to the energy sector include: a high dependence on imported primary energy sources; a limited number of electricity providers; and lack of investment in rehabilitation and development. Trescilo suggested an economic reform of the energy sector to build capacity, increase national and foreign investments, diversify the import of primary energy sources, ensure that electricity supply can cope with demand, and strengthen the electricity market.

Tatjana Markov, Technical Assistant, Ministry for the Protection of Natural Resources and the Environment, Serbia, observed that her country's energy policy aims at increasing energy efficiency and the use of renewable energy sources. She noted that the problems faced by the Serbian energy sector include: low efficiency; high energy intensity; high environmental impacts of energy production and consumption; lack of international co-operation; absence of integration in energy markets; and high dependency on energy imports. Markov outlined Serbia's climate change programme for GHG emissions mitigation, which aims to enhance awareness and knowledge relating to climate change issues, establish an inventory of trends for sources and sinks of GHG emissions, build national capacity, and strengthen information exchange and cooperation among stakeholders.

Besim Islami, Head of the National Energy Agency, Albania, highlighted that Albania faces high energy intensity and low energy consumption per capita, and that it is importing an increasing amount of its electricity. He informed participants that two energy demand forecast scenarios had been designed to provide advice to policy makers on

energy efficiency policies: the "passive scenario," representing a business-as-usual approach, and the "active scenario," taking account of policy reforms. He explained that the "active scenario" forecasts high energy diversification, energy savings and emissions reductions. Islami indicated that energy efficiency could be increased significantly by training workers and improving the operation of boilers and furnaces, and pointed to the role of fuel switching, good housekeeping and efficient lighting in increasing energy efficiency.

Vladimir Laskarevsky, Research Fellow of the Institute of Energy, Ukraine, presented on JI opportunities in Ukrainian industry. He stated that the main barriers to climate-friendly projects are: lack of investment due to a weak domestic banking system; the unstable financial situations of many enterprises; the absence of effective energy saving mechanisms; a shortage of trained and skilled staff to develop projects; and inadequate information on energy efficiency measures. Noting the low number of JI projects undertaken in his country, Laskarevsky expressed hope that the situation would change, and gave examples of potential JI projects that could be carried out in the industrial sector.

CENTRAL ASIA PANEL: Lyubov Inyutina, Senior Expert of the Climate Change Coordination Center, Kazakhstan, outlined a climate-friendly technology transfer project between Kazakhstan and Japan, which involves the installation of a gas turbine facility to increase energy efficiency of the Ural Heat Station and aims to ensure environmental safety. She noted the potential for replicating this project and attracting foreign investment in Kazakhstan. Inyutina highlighted recommendations for technology diffusion, including: raising stakeholder awareness of the benefits of the Kyoto Protocol mechanisms; increasing transparency; fostering the participation of NGOs and the private sector in combating global warming; encouraging enterprises to compile their GHG inventories; identifying JI projects; and establishing a national JI Board.

Ilhomjon Rajabov, Expert on Climate Change, Ministry for Nature Protection, Republic of Tajikistan, noted that the first Tajik National Communication was submitted to the UNFCCC Secretariat in October 2002, and reported that the second phase of the first National Communication was now being prepared. He stressed the importance of improving national policies and measures to promote international investment to solve climate change problems. Rajabov observed that Tajikistan faces financial, institutional, market and technological barriers to technology transfer, including poverty, insufficient capital for updating technologies, lack of institutional structures to implement CDM projects, inadequate local-level support for low-energy plans, insufficient reforms in the energy sector, outdated technologies, and inadequate technological maintenance.

Irina Atamuradova, Technical Assistant of the National Coordinator on Climate Change, Ministry of Nature Protection, Turkmenistan, stressed that there is no national interdepartmental body responsible for the transfer of state-of-the-art technologies in Turkmenistan. She highlighted the importance of organizing and coordinating all stakeholders in order to ensure the transfer and diffusion of environmentally-sound technologies. She underscored the need to create an information dissemination system connected to regional and international networks through a specialized body, and stressed the importance of raising public awareness on climate change and energy efficiency issues. Atamuradova noted the lack of highly-skilled experts in the field of climate change and technology transfer. To address this issue, she suggested improving the educational system, strengthening scientific and technical educational institutions, and developing further regional and international cooperation.

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Tatyana Ososkova, Chief of the Environment Pollution Monitoring Department, Main Administration of Hydrometeorology, Uzbekistan, identified the introduction of modern flare facilities as an option for reducing GHG emissions in the oil and gas sectors, and highlighted the burning of solid waste at special rates as an option for reducing GHG emissions in the waste sector. She highlighted various barriers to technology transfer, including limited State resources for purchasing equipment, State subsidies for energy consumption, and lack of human capacity in energy saving and efficiency. She recommended an integrated approach to addressing these problems, which should incorporate appropriate legislative measures, strengthened institutional capacities, secure financial support, and information dissemination.

TRANSCAUCASIA PANEL: Aram Gabrielyan, Head of the Department of Atmosphere Protection, Ministry of Nature Protection, Armenia, and Diana Harutyunyan, Project Coordinator of the Ministry of Nature Protection, Armenia, noted that the country's technology needs assessment was being finalized and that the Ministry of Nature Protection had been designated as the CDM national authority. They pointed out constraints to technology transfer, including: the absence of legislation on energy conservation and renewable energy; a lack of awareness among potential stakeholders; and a lack of human capacity, particularly in relation to CDM projects. They suggested a variety of measures to overcome such barriers, including implementing successful pilot projects, fostering community initiatives, and introducing environmental fees. They also proposed the development of a system of environmental insurance, and the establishment of low-interest rate loans for energy-related projects.

Marina Shvangiradze, Head of Division of Georgia's National Agency on Climate Change, stressed the significance of international institutions in providing technical and financial assistance in technology transfer. She said that capacity needs in Georgia include financial and technical assistance in implementing planned programmes and strategies, building CDM national capacity, and implementing long- and short-term strategies for developing renewable energy sources. She noted that barriers to private sector involvement in the development of energy efficiency projects include a lack of information on state-of-the-art renewable energy and energy efficient technologies, and insufficient capacity to develop investment proposals. She recommended increasing international assistance for CDM capacity building in host countries, and training regional experts on baseline and monitoring methodological issues and accreditation procedures.

DISCUSSION: One participant noted the need to consider further the use of renewable energy in the target regions. Another illustrated how Albanian reforms in the energy sector had resulted in the creation of a market for solar power, and stressed that appropriate tariffs are necessary to increase energy efficiency. Participants also addressed the role of the CDM Executive Board in promoting projects on energy efficiency and technology transfer.

SESSION SIX: PANEL DISCUSSION ON OVERCOMING FINANCIAL BARRIERS AND THE ROLE OF MULTILATERAL AND FINANCIAL ORGANIZATIONS

This session was chaired by Pim Kieskamp, with Sergei Levchenko acting as rapporteur. The four panelists addressing this issue were Jan-Willem van de Ven, Nikolay Nikolov, Marina Shvangiradze and Ferda Gelegen.

Chair Kieskamp raised the issue of whether inadequate financing was the most crucial barrier to technology transfer. Panelist Marina Shvangiradze responded that adequate financing is important for initi-

ating climate-friendly projects, but stressed that reliable data, low transaction costs and effective management systems are also crucial requirements. One participant suggested that lack of finance is not a barrier in itself but a consequence of other barriers that act as a disincentive for investment. Another participant disagreed, underscoring that many developing countries do not have a financial market to foster technology transfer. Panelist Ferda Gelegen noted the importance of focusing on projects that can attract investors, and highlighted the need for capacity building of host-country bankers on climate-friendly projects.

Chair Kieskamp then asked panelists what activities should be carried out in the target regions once the financial barriers are overcome. Panelist Marina Shvangiradze replied that she would encourage a comprehensive technology needs assessment that would be tested with pilot projects, and the improvement of data gathering, which she stressed as crucial for attracting projects. One participant highlighted the need for collateral for financing projects and asked how to overcome such a barrier. Panelist Jan-Willem van de Ven said equity arrangements and special environmental loans may be solutions, and panelist Ferda Gelegen suggested identifying investor countries that could provide collateral.

Finally, Chair Kieskamp raised the question of how to foster collaboration with international institutions relating to CDM and JI projects. In response, panelist Gelegen said cooperation is taking place in the field of capacity building, but noted that he was unaware of such cooperation in terms of financing.

CLOSE OF THE SEMINAR

On Wednesday, 29 October, Peter Pembleton introduced the closing session, highlighting various issues that had been identified in the regional presentations, including: financing; institutional structures; information, training and education; capacity building; demonstration of pilot projects; stakeholder coordination; standards and norms; legal frameworks and appropriate enforcement; energy efficiency; private sector participation; renewable energy; and support of local equipment manufacturing.

Daniele Violetti observed that the target regions are making significant progress in implementing sustainable energy systems and thus contributing to achieving the UNFCCC objective. He highlighted the importance of enabling environments, capacity building and private sector involvement in achieving technology transfer.

Vute Wangwacharakul highlighted the importance of intergovernmental organizations in facilitating the technology transfer dialogue among stakeholders, and noted country-specific circumstances and priorities. He stressed the importance of country-driven and integrated approaches to capacity building and technology transfer, and drew attention to the numerous barriers that must be removed in order to establish an enabling environment.

Shigetaka Seki commended the seminar's broad stakeholder approach. He stressed the need to give a clear structure to future consideration of the issues raised in the seminar, suggesting that barriers, or types of technologies, could be the focus of further discussions. He thanked all the participants, the UNFCCC Secretariat, UNIDO and the Austrian Government for their involvement in this seminar.

In his closing remarks, Peter Pembleton expressed his gratitude to the chairpersons and rapporteurs, UNIDO, the conference staff, and IISD's *Sustainable Developments* for its coverage of the seminar.

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Noting that he was looking forward to future cooperation with the CTI, he thanked the Austrian Government for hosting the seminar, and declared the meeting closed at 6:42 pm.

THINGS TO LOOK FOR

IPCC PLENARY 21ST SESSION: This meeting will convene from 3-7 November 2003, in Vienna, Austria. For more information, contact: IPCC Secretariat, C/O World Meteorological Organization; tel: +41-22-730-8208; fax: +41-22-730-8025; e-mail:

ipcc_sec@gateway.wmo.ch; Internet: <http://www.ipcc.ch/calendar.htm>

CONFERENCE ON DELIVERING CLIMATE TECHNOLOGY - PROGRAMMES, POLICIES AND POLITICS: This conference will be held from 4-5 November 2003, in London, UK, and is being organized by the Royal Institute of International Affairs and the Carbon Trust. It will examine the role of energy technologies in helping to respond to climate change and consider whether a new global energy regime is required. For more information, contact: Georgina Wright, Royal Institute of International Affairs; tel: +44-20-7957-5700; fax: +44-20-7321-2045; e-mail: conferences@riia.org; Internet: <http://www.riia.org/index.php?id=5&cid=36>

WORKSHOP ON BASELINE STANDARDIZATION FOR JI AND CDM PROJECTS: This expert meeting will convene from 6-7 November 2003, in Groningen, the Netherlands. The meeting will discuss the research conclusions of the European Project on Procedures for Accounting and Baselines for Joint Implementation and Clean Development Mechanism. For more information, contact: Wytze van der Gaast, Joint Implementation Network; tel: +31-50-309-6815; fax: +31-50-309-6815; e-mail: jiq@northsea.nl; Internet: <http://www.northsea.nl/jiq/workshop.htm>

FIFTEENTH MEETING OF THE PARTIES TO THE MONTREAL PROTOCOL: This meeting will be held from 10-14 November 2003, in Nairobi, Kenya. For more information, contact: Secretariat for the Vienna Convention and the Montreal Protocol; tel: +254-20-62-3850; fax: +254-20-62-3601; e-mail: Marco.Gonzalez@unep.org; Internet: <http://www.unep.org/ozone/meet2003.shtml>

CLIMATE CHANGE TECHNOLOGY BAZAAR AND CONFERENCE: Organized by the Indian Ministry of Environment and Forests in association with the UNFCCC Secretariat and UNEP, this meeting will convene from 10-13 November 2003, in New Delhi, India. It will include a meeting of the Expert Group on Technology Transfer, workshops on CDM and on adaptation, and a high-level roundtable on CDM. For more information, contact: Rajiv Makin, Ashok Services; tel: +91-11-2336-4415; fax: +91-11-2334-3167; e-mail: reservation@itdclimatechange.com; Internet: <http://www.itdclimatechange.com>

CONFERENCE ON CLIMATE CHANGE: WHAT NEEDS TO BE DONE IN NORTH AND SOUTH: This conference will convene from 17-20 November 2003, in Wilton Park, Sussex, UK. This conference will consider the actions needed in developed and developing countries to combat climate change. For more information, contact: Roger Williamson; tel: +44-1903-817-773; fax: +44-1903-814-445; e-mail: roger.williamson@wiltonpark.org.uk; Internet: <http://www.wiltonpark.org.uk/web/conferences/wrapper.asp?confref=WP730>

SECOND WORLD WIND ENERGY CONFERENCE - RENEWABLE ENERGY EXHIBITION 2003: This meeting will be held from 23-26 November 2003, in Cape Town, South Africa. It will address technological issues, policy and regulatory aspects, funding, return on investment and environmental impacts of wind energy. For more information, contact: The Registrar; tel: +27-21-914-2888; fax: +27-21-914-2890; e-mail: registrar@sbs.co.za; Internet: <http://www.sbs.co.za/wwec2003>

UNFCCC COP-9: This meeting will convene from 1-12 December 2003, in Milan, Italy. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; Internet: <http://www.unfccc.int>

FOURTH GLOBAL FORUM ON SUSTAINABLE ENERGY: This meeting will be held from 18-20 February 2004, in Vienna, Austria. For more information, contact: Irene Freudenschuss-Reichl; tel: +1-212-963-6890; fax: +1-212-963-7904; e-mail: freudenschuss-reichl@un.org; Internet: <http://www.gfse.at>

FIFTEENTH ANNUAL EARTH TECHNOLOGIES FORUM: This forum will convene from 13-15 April 2004, in Washington DC. The conference is co-sponsored by a variety of governments and UN agencies, trade bodies, and other organizations, and will address global climate change and ozone protection policy and technology issues. For more information, contact: Conference Secretariat; tel: +1-703-807-4052; fax: +1-703-528-1734; e-mail: earthforum@alcalde-fay.com; Internet: <http://www.earthforum.com>

TWENTY-NINTH INTERNATIONAL TECHNICAL CONFERENCE ON COAL UTILIZATION AND FUEL SYSTEMS: This meeting will convene from 18-22 April 2004, in Clearwater, Florida, US. The theme of this event will be "Coal From Hydrogen Is Here." For more information, contact: Barbara Sakkestad, Coal Technology Association; tel: +1-301-294-6080; fax: +1-301-294-7480; Internet: <http://www.coaltechnologies.com/conferences.html>

INTERNATIONAL CONFERENCE FOR RENEWABLE ENERGIES: This conference will be held from 1-4 June 2004, in Bonn, Germany. Themes to be considered include financing and market development, enabling political framework conditions, and capacity building. For more information, contact: Secretariat of the International Conference for Renewable Energies 2004, Bonn, Postfach 5180, 65726; tel: +49-6196-794404; fax: +49-6196-794405; e-mail: info@renewables2004.de; Internet: <http://www.renewables2004.de>

SEVENTH INTERNATIONAL CONFERENCE ON GREENHOUSE GAS CONTROL TECHNOLOGIES: This conference will convene from 5-9 September 2004, in Vancouver, Canada, and is organized by the University of Regina and Natural Resources Canada, in cooperation with the International Energy Agency. It will examine the latest advances in the field of greenhouse gas control technologies, including capture, storage and utilization of carbon dioxide. For more information, contact: Ted Morris, Conference Secretariat; tel: +1-306-337-2290; fax: +1-306-337-2301; e-mail: Ted.Morris@uregina.ca; Internet: <http://www.ghgt7.ca/main.html>

NINETEENTH WORLD ENERGY CONGRESS: This meeting will be held from 5-9 September 2004, in Sydney, Australia. For more information, contact: Nineteenth World Energy Congress Managers; tel: +612-9248-0800; fax: +612-9248-0894; e-mail: energy2004@tourhosts.com.au; Internet: <http://www.tourhosts.com.au/energy2004>