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Item 4 of the provisional agenda

Development and transfer of technologies

**Summary of the senior-level round-table discussion on enabling environments
for technology transfer, held at the ninth session
of the Conference of the Parties**

Note by the secretariat

Summary

The senior-level round-table discussion held at the ninth session of the Conference of the Parties was organized by the secretariat in consultation with the Expert Group on Technology Transfer and representatives of the business community in response to a mandate by the Subsidiary Body for Scientific and Technological Advice at its eighteenth session. Participants highlighted different technology transfer experiences, and common needs and concerns, and discussed ways to enable environments for technology transfer at national and international levels.

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I. Introduction

A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its eighteenth session, requested the secretariat to organize, in consultation with the Expert Group on Technology Transfer (EGTT) and in cooperation with other relevant organizations, a senior-level round-table discussion between representatives of governments, business and industry at the ninth session of the Conference of the Parties (COP), to discuss enabling environments for technology transfer under Article 4, paragraph 5, of the Convention (FCCC/SBSTA/2003/10, para. 33 (l)). This event was held on 8 December 2003 in Milan, Italy.

B. Possible action by the Subsidiary Body for Scientific and Technological Advice

2. The SBSTA may wish to take note of the information contained in this document and determine what additional action it wishes to take. The SBSTA may also wish to consider recommendations provided by the EGTT after its fifth meeting, which will be convened on 13 and 14 June 2004 in Bonn, and any information provided by the secretariat with regard to its collaboration with business and industry on this matter, and decide on any appropriate next steps.

II. Organization

3. The round-table discussion was moderated by Mr. Halldor Thorgeirsson, Chair of the SBSTA and was organized as a panel discussion divided into three segments. The panellists are listed in annex I to this document.

4. The first segment covered issues relating to the role of governments and international cooperation and partnerships in creating favourable conditions for development and transfer of technologies. The second segment focused on infrastructure and governance, markets, trade rules, and investments, including case studies. The third segment emphasized the importance of public and private partnership and synergy, also with case studies.

5. After opening statements by the Chair, the Executive Secretary of the UNFCCC, the Chair of the EGTT and a representative of business and industry, each panel member made a statement on the topic of the segment. These statements were followed by general discussions, conclusions from a representative of the private sector and final remarks by the Chair.

6. Some 200 participants representing Parties, international organizations, business and industries, non-governmental organizations (NGOs) and the media attended the round-table discussion. The video web cast of the event is available on the UNFCCC web site.¹ The presentations made by panellists and other related documents are available on the UNFCCC technology information clearing house (TT:CLEAR).²

¹ <http://cop9.str3.com/>

² <http://ttclear.unfccc.int>

III. Report of the round-table discussion

7. This report should be read in conjunction with the technical paper on enabling environments for technology transfer (FCCC/TP/2003/2) and the recommendations of the EGTT on this matter to the SBSTA at its nineteenth session (FCCC/SBSTA/2003/12, para. 22). This report contains a summary of the views expressed by panellists and participants, grouped by topics.

A. General issues

8. Many panellists emphasized the importance of technology to meet the long-term objective of the Convention, which requires wide use of currently available technology and the development and use of new, breakthrough technologies. The panellists pointed out that the transfer and dissemination of existing technologies to developing countries could considerably reduce emissions from their business-as-usual trends in the short term. It was also noted that most of new and advanced technologies are developed and owned by the private sector.

9. Business representatives stressed that any successful movement of technology must benefit both suppliers and recipients. Furthermore, the term technology “diffusion” should be used. The terms “transfer” or “dissemination” were seen as a supply-push model, in which some organized flow of technologies across national borders is coordinated by stakeholders and managed by central organizations. The term “diffusion”, on the other hand, is seen as a demand-pull concept which is how the majority of technologies are transferred.

10. Up to now, much of the attention has been focused on technologies for mitigation of greenhouse gas emissions. This should certainly continue and intensify. But it must be complemented by transfer of technologies to meet the special needs of adaptation to climate change, such as a greater emphasis on policy frameworks that advance both adaptation and sustainable development.

11. Panel members from developed and developing countries and business made references to some relevant agreements and documents. Panel members from developing countries said that the chapter 34 of Agenda 21 stated their need for access to environmentally sound technologies and know-how on a non-commercial basis and on favourable terms. Panel members from developed countries saw the Johannesburg Plan of Implementation as an important document that clarifies the need to overcome, in theoretical and practical ways, the conflicts between environment and development, between public sector and private investments, and between the roles of governments and business communities in order to protect the local and global environment. And the World Trade Organization (WTO) Ministerial Declaration made in Doha was cited by panel members from business as an important step for defining the relationship between international trade and investment and transfer of technology.

12. The panellist from China pointed out the huge gap between what shall, should and can be done, as indicated by the Convention and the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report (TAR), and the framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention (decision 4/CP.7), referred to hereinafter as the technology framework. These documents list measures that need to be taken by all Parties to enhance the enabling environments for technology transfer. However, they do not pinpoint the most fundamental factor underlying this subject, namely political will.

13. During climate change negotiations it has become clear that the provisions of the Convention relating to technology transfer are key to achieving the political basis of an international package to

respond to climate change that will encourage and enable developing countries to participate in future mitigation actions.

14. Panel members from developing countries suggested that an agreement on technology development and transfer should be negotiated as a core element of a cluster of post-Kyoto arrangements. Such an agreement will forge a stronger link between international mitigation actions and the requirements of Article 4.5 and 4.7 of the Convention, and will create better enabling environments for technology transfer at the international level. It will allow Parties to move from their old positions – free transfer of environmentally sound technologies (ESTs) as a commitment (developing countries) or leaving technology transfer entirely to market forces (developed countries) – to a more practical approach based on partnership and mutual benefits while preserving the basic principles of the Convention.

B. Barriers to technology transfer and measures to overcome them

15. Barriers exist at every stage of the technology transfer process – technical, economic political, cultural, social, behavioural and institutional. Some examples of barriers that hinder technology transfer, cited by the panellist from Ghana, are presented in annex II. However, the panellist stated that governments can and should play a wider role in creating enabling environments that would facilitate transfer of, and access to, ESTs.

16. Lack of awareness and information were cited as major barriers to technology transfer. Panel members from developing countries requested that developed country Parties provide, in their national communications, more specific information on their technology transfer activities. This reporting could be done in consultation with the private sector, NGOs and knowledge institutions in their respective countries.

17. Many developing countries are now identifying their technology needs through a thorough analysis that takes account of the development plans and strategies of their countries. Panel members from Argentina, Ghana and United States of America stressed that technology needs assessments are pivotal in bringing together the relevant stakeholders and focusing on the information, capacity-building, enabling environment and mechanisms necessary to ensure sustainable technology transfer.

18. From a business perspective, a distinction should be made between micro- and macro-barriers to technology transfer. Micro-barriers exist at the project level, specific to certain technologies and regions of deployment. They arise from cultural, environmental, financial, human capacity, and legal and technological factors and they can be addressed directly by individual stakeholders. Macro-barriers are policy-level issues, often spanning technological categories and geographical boundaries. They require broad, coordinated actions from various stakeholders. Specific examples of such barriers are given in annex II.

19. Panel members from developing countries identified various examples of policies and measures that are geared towards attracting technologies into their countries: institutional set-ups (e.g., environmental protection agencies, energy commissions, investment promotion centres and standardization boards), poverty reduction strategies, strategic national energy plans, energy efficient labels, development of standards and codes, and improvement of government procurement procedures.

20. Business panel members highlighted further important measures to overcome barriers to technology transfer: assessment of technology needs, adaptation of technology to local conditions, building capacity to understand and operate the technology transferred, and connection with the local institutions, including with research and development institutions and universities.

21. The panel member from the International Energy Agency (IEA) highlighted the need to take aggressive advantage of the following existing mechanisms: bilateral and multilateral initiatives such as for CO₂ sequestration and storage, fusion, and the hydrogen economy; scholarships and education opportunities; the Climate Technology Initiative (CTI); and some 40 other international research and development collaboration agreements of the IEA, ranging from renewable energy to fossil fuels to fusion, that were open to participation by developing countries.

C. Partnership with the private sector

22. Successful technology transfer involves a wide variety of stakeholders, including the private sector and NGOs, and governments play an essential role in creating favourable conditions for the participation of these stakeholders. Although national circumstances differ widely, opportunities exist for facilitating technology transfer through appropriate enabling environments in both transferring and recipient countries.

23. The panellist from the United States mentioned that his country continues to urge the structuring of an effective public-private sector partnership for risk sharing, information dissemination and management and to leverage scarce resources. Because the bulk of investment being made in developing countries comes from private sources, it is essential to engage the private sector in the process and incorporate climate considerations, to the extent appropriate and cost-effective, in the technology selection process and infrastructure investments.

24. The panellist from the United States also mentioned that, in applying the technology framework, his country continues to support a multidisciplinary approach and a broad range of bilateral and multilateral activities designed to facilitate the transfer of ESTs and practices to developing and transitional economies.

25. Many business panel members noted that the industry, which is kept out of intergovernmental negotiations, is usually sceptical about the capabilities of these processes to develop concrete decisions that would be implemented in the real world. This relates, *inter alia*, to the large periods of time that complex intergovernmental negotiations need to reach completion. It was also mentioned that, from a business point of view, bilateral discussions, company-to-company and government-to-government, are essential, but need to be complemented by multilateral agreements.

26. Business panel members stressed that the private sector is ready to invest where the conditions encourage doing so. Businesses are accustomed to risks and do not expect to work in a risk-free society, but they need to be able to understand the risks and plan to manage them. When companies and corporations are called to support technology transfer they do so. For example, the panel member from the Union of Industrial and Employers' Confederations of Europe (UNICE),³ noted that European companies have since the early 1990s been able to increase their direct investments in developing countries from EUR 38 to 100 billion, while the direct assistance from developed countries dropped dramatically.

27. In addition to funds from the Global Environment Facility (GEF) four other types of investment flows relevant for the transfer of technologies were cited: foreign direct investment (FDI), official development assistance (ODA), loans and portfolio investments. Developed country and business panel members noted that, of those flows, only FDI has steadily increased over the past decade. Therefore, if FDI is, and will continue to be, one of the main vehicles of technology transfer, then it is critical to ensure that the necessary conditions are in place to encourage this flow and to ensure that all countries have access to it.

³ A confederation of European industries.

28. Two successful mechanisms to promote partnerships with the private sector were mentioned by the panel member from Chile:

- (a) Clean production agreements between the government and the private sector in areas such as mining and energy: these agreements provide companies with special timelines to comply with environmental regulations. The State guarantees their access to natural resources if they comply with these regulations. The agreements promote uniform compliance and were developed in consultation with all stakeholders, including the private sector, academia, NGOs and civil society.
- (b) Side agreements: these agreements, which were used by the government to negotiate free trade agreements, allow private sector representatives to participate as observers during bilateral negotiations conducted by the government.

D. Legal and regulatory frameworks

29. Establishing a stable institutional setting with sound economic and regulatory frameworks and transparent regulatory and judicial system is essential for private sector participation. Clear, transparent and predictable national and international laws and regulations are important to attract foreign and private sources of capital, technology and expertise, and to facilitate modernization and diversification of energy sources within emerging markets.

30. Business panel members underlined that the enabling environment actions and initiatives are broader than those traditionally considered as climate or environmental in nature. Open, rules-based trade and investment, transparent and equitable legal and financial structures, and fair distribution of benefits and access to resources for all partners will stimulate innovation and entrepreneurship for development in more climate-friendly directions. Legal and regulatory frameworks are essential to ensure companies can realize returns on investments and cover their research and development costs.

31. Panel members from government and international organizations mentioned that these legal and regulatory frameworks should facilitate the transfer of technologies that are substantially better than what can be marketed in the absence of appropriate standards. Many countries in the developing world have had examples of receiving obsolete technologies with standards that would not be acceptable in other countries or that carry hidden costs.

32. The panellist from Italy pointed out that the European Union (EU) is committed to create in Europe an efficient economy which balances economic growth with the protection of the environment. The EU policy to achieve this aims at creating the best conditions within the European market to stimulate the development of competitive energy- and environmentally efficient technologies. It also aims to change in part the paradigm from command and control to voluntary commitments and agreements between governments and the private sector. This setting should favour the development of ESTs and of fiscal systems that promote ESTs versus traditional technologies. There are already many examples of European and national legislations that are heading in this direction.

33. The panellist from the IEA said that many countries have adopted, or are in the process of adopting, regulatory reforms in order to attract sufficient international investment and technology transfer. In some developing countries, however, although such reforms might be enacted, their enforcement is weak and governments have to do more to enforce them. Developing countries should also establish legislation to allow modern technologies to compete with traditional technologies.

34. Business panel members mentioned that public policies should not dictate the movement of technologies directly. Stakeholders should cooperate to encourage market forces, in the context of a

level playing field of public policies, to pull technologies to places where their application would be of highest value.

E. Technology transfer and Kyoto mechanisms

35. Over time, the clean development mechanism (CDM) projects may contribute to the development and transfer of technologies as this mechanism adds the use of a new international economic instrument to the instruments that contribute to creating enabling environments. Panel members from Chile and Italy expressed their hope that the CDM will serve as a vehicle to promote technology transfer, especially in the area of energy, but also in the field of transport, which is critical for sustainable development in developing countries such as Chile.

36. The panel member from Italy emphasized that Joint Implementation (JI) and the CDM are based on a partnership between public and private sectors. Many times these mechanisms have been considered a limitation, a sort of loophole to avoid national commitments, but in reality they represent a proper channel to foster national investments for technology diffusion and transfer. The ninth session of the Conference of the Parties should therefore end with a clear commitment to support the implementation of the conditions to make those mechanisms operational, and Italy is ready to back this commitment, in particular to set up the CDM international transaction log.

37. Business panel members also underlined the importance of the CDM, JI and emissions trading (ET) as effective mechanisms to facilitate technology transfer and to promote participation of the private sector. European companies will start trading emission certificates on 1 January 2005.

F. Technology development

38. Most economically feasible ways forward to address climate change require both widespread use of existing efficient technologies and the development and use of innovative technologies. As stated above, these will come predominantly from business and they require major capital investments for research, technology development and dissemination.

39. With regard to joint research and development one positive example cited by panellists was the access by a number of developing countries to international research and development activities for two crucial technologies: carbon sequestration and storage, and the hydrogen economy. These initiatives were seen as concrete examples of improving enabling environments at international level. Another example, already mentioned above, was the opening of the international research and development collaboration agreements of the IEA to participation from developing countries.

40. Developing countries need further support to improve their national systems of innovation, promote research and development and stimulate the creation of intermediaries to facilitate technology transfer. It was also noted that most adaptation-related research is carried out in industrialized countries. Therefore, it may be beneficial for the transfer of adaptation technologies to undertake joint research and development with receiving countries.

41. The panellist from the United States pointed out that the EGTT's programme of work for 2004 includes exploring opportunities to enhance the capabilities of existing institutions in developing countries to serve as clean energy centres for facilitating technology transfer at the local, national and regional levels. Notably, many multi-national enterprises have established research and development centres in host countries to tap into the local pool of technical talents, promote locally oriented research and development, and participate in the global research and development activities of these multi-national enterprises.

G. Energy-sector-specific aspects

42. The panel members from World Energy Council (WEC) mentioned access to electricity as a key element for bridging the North–South gap. Some 1.6 billion people living in the developing world are not yet connected to a commercial energy supply. They need simple and cheap electricity generation, transmission and distribution systems, but not the high costs and the high reliability standards of the industrialized world. To promote economic development, electricity development should be linked to development in other sectors such as water, agriculture, small and medium-sized enterprises, information and telecommunication, transport and education.

43. To mobilize greater private sector investment in clean and efficient energy projects more attention needs to be paid to identifying and reducing the critical risks associated with these investments and developing financial products and financing protocols that can reduce costs, better standardize transactions and offset the risk premium of investing in emerging markets. Some key issues and problems identified in the area of energy efficiency were:

- (a) Relatively flat return curves in energy service company (ESCO) investments mean that investors are not necessarily compensated for higher risk. The public sector could enhance returns in higher risk environments by offering low interest loans, long guarantees or equity return insurance;
- (b) Higher transaction costs with respect to small and medium-sized energy efficiency investments might be addressed by special grants (a grant requiring repayment upon a triggering event) to offset early project costs. Contract guarantee risk is a critical barrier to expansion of ESCOs in emerging economies. Insurance could be provided on guarantees for energy performance contracts serving the small to medium-sized efficiency markets;
- (c) Energy tariff and tax uncertainties. Energy tariff reforms tend to be delayed and tax policies, which affect investment decisions, are too frequently revised. There is a need to promote energy tariff reform and reliable tax policies for attracting foreign investment in energy efficiency and renewable energy projects.

44. Business panel members underscored some actions to accelerate implementation of renewable energy (RE) projects: adopt innovative financing schemes (e.g., green certificates, CDM); help countries identify and commit to realistic RE portfolio targets based on national priorities; establish free-trade zones for RE; develop a regional policy framework to monetize regional and local renewable energy project benefits.

45. The following factors were cited as essential, by business panel members, to enable environments for RE projects: policy compatibility (cooperation with public sector in policy-making and experience sharing); capacity-building (public–private partnerships to identify market approaches, develop common business practices, optimize incentives and investments); project management assistance (establish or enhance centres to teach developers to prepare good project proposals); and increased investments (financial sector partnerships, innovative financial instruments to mobilize capital, assess trading mechanisms and promote pilot use of the CDM).

H. Case studies

46. Examples presented during the round-table discussion highlighted the similarities and differences between technology transfer promoted by government funds and private investments. The following

positive experiences were mentioned by government, business and international organization panel members:

- (a) The Montreal Protocol was cited by the panel member from IEA as an example of a major success that was achieved through a combination of financing, scientific interest and international cooperation. Some USD 1.5 billion worth of technology has been transferred to participating countries. By comparison, the financing that has been provided through the Global Environment Facility (GEF), although it was a major addition to financing technology transfer, was only a very small part of the total needs for transfer of climate friendly technology;
- (b) Projects conducted by Italy in China on development of scientific and industrial projects for environmental protection and use of renewable energy sources; and the partnership in the Mediterranean countries for the development of renewable energy sources and technology transfer, including the establishment of a training centre devoted to renewable energy sources in Tunisia;
- (c) A gas turbine combined cycle (GTCC) power plant under construction by the Nigerian Power Corporation, a venture managed by ENI, Italy, which uses gas collected from flaring. In Nigeria some 600 million cubic metres of natural gas are flared every year in the absence of a law regulating this activity. The project has a minimal internal rate of return (IRR) but the financial additionality that might result from considering the reduction 1.2 million tonnes of CO₂ per year will make the project more attractive;
- (d) Transferring nuclear power plant (NPP) technology to China, a 20-year experience of FRAMATOME, France. The transfer, including electricity generation and nuclear fuel fabrication technology, took place gradually in three phases: the site installation was made in cooperation with a local company (Daya Bay NPP); the site installation was subcontracted to a local company and some equipment was produced locally (Ling Ao NPP); and two pressurized water reactor units were totally designed and build by Chinese companies with FRAMATOME technology (Quingshan NPP);
- (e) Experiences by ABB Italia and the E7, including providing access to electricity, rural electrification and transferring renewable energy technology such as micro-solar, geothermal, biomass, micro-hydro and wind in Bangladesh, Bolivia, China, India, Indonesia, Kenya, Mozambique, Morocco and New Zealand. The initial power density and load is very low in least developed countries and recent technology allows low cost for transmission of electricity, even for a few megawatts over hundreds of kilometres. Therefore, in some situations, cheap and clean electricity with adequate reliability may be available from neighbouring regions.

47. Based on these and other experiences, the following success factors were mentioned by business panellists: a good local model of governance and an acceptable level of corruption that makes investments attractive; stable and credible legislation that would allow tax and corporate profit to be carefully planned; an acceptable level of intellectual property rights protection; political frameworks; and firm bilateral agreements with partners. An optimized mix of technology transfer and localization associated with contracts is important so that both partners feel that they are in a transparent relationship. Cooperation in challenging projects can also boost the transfer of technology.

IV. Issues for further consideration

A. Intergovernmental process

48. Panel members from developing countries suggested that technology use, development and transfer be identified as the subject matter of a core agreement of a cluster of post-Kyoto arrangements. Such an agreement would forge a stronger link between international mitigation actions and the requirements of Article 4.5 and 4.7 of the Convention, and will create better enabling environments for technology transfer at the international level.

B. Financing technology transfer

49. For developing countries financing remains a core issue of technology transfer. Therefore, there is a need for further work on innovative financing schemes that have the potential to address the issues of high investment risks, high transaction and investments costs and loan guarantees, in particular for those technologies identified in technology needs assessment studies carried out by developing countries.

50. With regard to innovative financing the following areas were suggested by panel members from developed countries for further focus and strengthening:

- (a) Analysis of the business case for investment in clean and more energy efficient infrastructure development and technology commercialization. Examining the market drivers as well as the risks associated with such investment, the investment and financial regulatory regimes and the development of financial tools and fiscal incentives for managing those risks.
- (b) Financing market development, which is moving from government proposed projects to market driven project development, based on demand for capital and for cleaner and more efficient energy services and infrastructure. This will require the development of locally managed financial programmes. Financial intermediaries are also needed, particularly in the case of energy efficiency projects, to connect the interest of vendors, investors, developers and borrowers. For example, local financial intermediaries could develop, bundle and manage portfolios of investments targeted at small and medium-sized energy efficiency projects.
- (c) Structuring special financing vehicles to make capital more portable and accessible and reduce risks, uncertainty and costs.
- (d) Public sector efficiency and renewable energy projects for which local commercial infrastructure development and market formation may be easier to achieve. These projects generally have similar ownership and management arrangements and more straightforward credit histories. Furthermore, the risk may be easier to address on a collective basis for public sector projects. The public sector represents a potentially large and critical market for energy efficiency and renewable energy services and can improve energy efficiency and conservation awareness of the whole community.

51. Panel members also suggested further exploration of actions on reorientation of public interventions such as ODA and the interventions of international financial institutions, to develop the best environment for the ESTs, in the global market, and lay the foundations for private investment initiatives.

C. Partnership with the private sector

52. The round-table discussion was seen by many panellists as a milestone for cooperation and partnership with the private sector. The planning process has been a model for the marriage of the elements of leadership, partnership and action. Business is looking forward to finding ways to continue and enhance this process, appropriate to the long-term implementation challenges ahead.

53. Workshops around priority themes and sector-related issues for EGTT topics are of great interest to business, and business will pursue this in partnership with the EGTT. Another suggested activity was to organize an international workshop to further explore ways and means to enhance the participation of the private sector in this process.

54. The EGTT should look for ways to build scientific, technological and management capabilities to address climate change, especially in developing countries. Business must also do more to enhance enabling frameworks: voluntary initiatives, sharing of good practice, research and development, improving the performance of current technologies, and technology cooperation. Business looks forward to exploring and advising the EGTT of its efforts in these areas.

D. Development of technology

55. Traditional technological development and implementation alone do not appear to be sufficient to address the challenges of climate change. Some recent partnerships such as the hydrogen economy and carbon sequestration and storage were seen as steps in the right direction. Future work is needed to extend these experiences and formalize them.

Annex I**Agenda**

1.	<p>Opening keynote addresses</p> <ul style="list-style-type: none"> • Mr. Halldor Thorgeirsson, Chair of the SBSTA, Moderator • Ms. Joke Waller-Hunter, Executive Secretary of the UNFCCC • Mr. William Kojo Agyemang-Bonsu, Chair of the EGTT • Mr. Charles Nicholson, Senior Adviser, British Petroleum, United Kingdom of Great Britain and Northern Ireland
2.	<p>Panel on the role of governments and international cooperation and partnerships in creating favourable conditions for development and transfer of technologies</p> <ul style="list-style-type: none"> • Mr. William Kojo Agyemang-Bonsu on behalf of H.E. Kasim Kasanga, Honourable Professor, Minister, Ministry of Environment and Science, Ghana • Mr. Corrado Clini, Director General, Global Environment, International and Regional Conventions, Ministry for the Environment, Italy • Mr. Gao Feng, Deputy Director-General, Department of Treaty and Law, Ministry of Foreign Affairs, China • Ms. Marianne Haug, Director, Office of Energy Efficiency, Technology and R&D, International Energy Agency
3.	<p>Panel on infrastructure and governance, markets, trade rules, and investment; case studies</p> <ul style="list-style-type: none"> • H.E. José Manuel Ovalle, Ambassador, Director for Environment, Foreign Affairs Ministry, Chile • Ms. Larisa Dobriansky, Deputy Assistant Secretary for National Energy Policy, Department of Energy, United States of America • Mr. Fabrizio D'adda, ENI, Environment Director and Chairman of UNICE Industrial Affairs Committee, Italy • Mr. Alain Calamand, Vice-President in Charge of Communication in the Plants Sector of FRAMATOME ANP, France
4.	<p>Panel on public/private partnership and synergy; case studies</p> <ul style="list-style-type: none"> • Mr. Alessandro Clerici, ABB Italia, Chairman of the World Energy Council Italian Committee, Italy • Mr. Roberto Vigotti, International Relations Manager with ENEL Generation, E7
5.	<p>Summary</p> <ul style="list-style-type: none"> • Ms. Norine Kennedy, United States Council for International Business • Mr. Halldor Thorgeirsson, Chair of the SBSTA

Annex II

Examples of general and micro- and macro-barriers to technology transfer and recommendations for their removal

GENERAL BARRIERS (cited by government panel members)	
<ul style="list-style-type: none"> • Lack of infrastructure, inflation and high interest rates, and impact of international monetary and fiscal policies • Inadequate capacity to assess environmental externalities associated with technologies, low capacities within the country, and inadequate policies and support mechanisms • Lack of consistent and coherent technology transfer policies, inadequate technical standards and quality control • Lack of clear-cut IPR laws, lack of access to information, including costs and performance standards • Poverty, which leads to inability of citizens to pay • Lack of sustained good governance • Lack of social acceptance of some technologies (e.g., a biogas plant in Ghana that has not received support from local people) • Lack of attractiveness to financiers due to commercial and technical abilities • Lack of privatized technologies 	
MICRO-BARRIERS (cited by business panel members)	
Barriers	Recommendations
Legal and political	
Lack of involvement by local stakeholders	<ul style="list-style-type: none"> • Secure cooperation of a powerful local partner to facilitate projects • Utilize local firms in project construction and maintenance to increase local development • Recognize dynamic relationship between governments and markets in electricity sector • Request cooperation from governments in conducting resource assessments
Financial	
Lack of appropriate finance mechanisms	<ul style="list-style-type: none"> • Draw upon demonstration projects • Conduct local financial resource assessments • Develop understanding of local economy, supply and demand patterns
Technical	
Technical challenges	<ul style="list-style-type: none"> • Test and be aware of the quality of locally manufactured supporting products • Recognize and account for unique characteristics of certain technologies
Management challenges	<ul style="list-style-type: none"> • Utilize technologies that are technically appropriate for locations • Tap into local knowledge, skills, experience to optimize project operation • Recognize differences in management needs specific to various project locations • Conduct localized research and development, testing
Cultural	
Institutional integration with local community	<ul style="list-style-type: none"> • Understand local culture • Secure early buy-in • Establish transparency in procedures • Gain cooperation of a local NGO as intermediary • Designate a local, not external, point of contact for project

Lack of information regarding relevant technologies and systems	<ul style="list-style-type: none"> • Draw upon demonstration projects • Conduct local resource assessments • Develop understanding of local economy, supply and demand patterns
Human	
Lack of trained personnel	<ul style="list-style-type: none"> • Training and train trainers • Demonstrate patience with learning curve associated with new technologies • Offer troubleshooting practice on model equipment • Use channels and tools for requesting remote assistance
Inadequate recognition of energy's contribution to rural development	<ul style="list-style-type: none"> • Integrate with community planning to facilitate employment growth in rural areas • Undertake efforts to enlist local community support by highlighting ancillary benefits of electrification
MACRO-BARRIERS (cited by business panel members)	
Barriers	Recommendations
Legal, political and institutional	
Sovereignty issues	<ul style="list-style-type: none"> • Respect the rules, defer to sovereign rights • Cultivate high level relationship based on interest of beneficiaries
Government policies discouraging RE	<ul style="list-style-type: none"> • Foster intergovernmental cooperation on sustainability • Cultivate growth of sectoral industry associations to influence public policy
Relation with stakeholders	<ul style="list-style-type: none"> • Strive for win-win situation • Recognize multistakeholder dynamics
Institutional acceptance	<ul style="list-style-type: none"> • Recognize that broad promotion of renewable energy is valuable • Diversity of models for public-private cooperation is appropriate • Cultivation of appropriate associations (academic, industrial)
Dissemination of knowledge	<ul style="list-style-type: none"> • Cultivate appropriate associations for renewable energy (e.g., academic or industry associations) • South-South cooperation
Financial	
Unprofitable project economics	<ul style="list-style-type: none"> • Establish level playing field for all alternatives • Clarity on expected willingness to pay, desired return on investment, ancillary objectives • Factor, even capture, positive externalities of electrification in financial evaluation
Lack of access to capital	<ul style="list-style-type: none"> • Understand complex relation between electrification and development planning • Value of government intervention through targeted assistance • Develop more financially viable business plans
Technical	
Operational conditions	<ul style="list-style-type: none"> • Cooperation between governments, research centres and private industry to develop appropriate technologies for challenging operating conditions
