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**An Analysis of Effective Operationalization of Provisions on  
Transfer of Environmentally Sound Technologies to  
Developing Countries in Multilateral Environmental  
Agreements, Pursuant to Agenda 21**

Draft Discussion Paper

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## **1. Defining Transfer of Environmentally Sound Technologies**

Agenda 21 defines the transfer of environmentally sound technologies (ESTs) as follows: “Environmentally sound technologies are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. This implies that when discussing transfer of technologies, the human resource development and local capacity-building aspects of technology choices, including gender-relevant aspects, should also be addressed. Environmentally sound technologies should be compatible with nationally determined socio-economic, cultural and environmental priorities.”<sup>1</sup> Transfer of technology (ToT) therefore includes the transfer of hardware, accompanied by a transfer of technical and managerial skills required to make full use of a new technological solution. The latter explains why productivity and environmental performance levels can widely vary among firms which deployed the same technology.

Effective use of transferred ESTs also requires conducive macro-economic, in particular incentive-based policies. This encourages two very important things: on the one hand, conducive macro-economic incentives stimulate full use of acquired ESTs. On the other hand, they encourage the private sector in developing countries to seek industry partnerships with companies or industry associations in developed countries to get access to new ESTs and to further improve thus acquired ESTs, based on innovative abilities in developing countries.

## **2. The characteristics of the international technology market and its recent changes**

The international technology market has been subject to profound change in recent years due to four clusters of factors: (i) escalating R&D costs caused by shorter commercial life cycles of products; (ii) enterprise behaviour; (iii) the use of international property rights (IPRs) to expand market power; and (iv) the liberalization of import regimes in many developing countries.

The costs of generating technology have escalated in recent years in the light of shrinking commercial life-cycles of products. Globalization of product markets has intensified competition, putting pressure on producers to constantly innovate and improve their products and renew them at much shorter intervals. For example, the cycle of renewing most passenger car models has shrunk to about 2-3 years. Even in the case of commodities, modern steel varieties are hardly older than 3-5 years. As a result, R&D costs have escalated and it has become more and more problematic to pass these costs onto final customers.

Escalating R&D costs have encouraged enhanced collaboration among enterprises and governments to promote technological innovation. Increased R&D costs and the above-illustrated changes in production and marketing have also been important factors behind the wave of mergers, acquisitions and strategic alliances that occurred in developed countries in recent years. Mergers, acquisitions and strategic alliances are seen as a means of gaining access to technology and realizing economies of scale and scope.

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<sup>1</sup> Agenda 21 - The United Nations Programme of Action from Rio, New York, 1992, p. 252.

With the exception of the electronics industry (in very few countries in Southeast Asia), the spate of strategic alliances comprising R&D co-operation has so far not extended to developing country firms to any significant extent. In a North-South context, co-operation between supplier and acquirer is usually related to the proper implementation and absorption of technologies, but does not comprise the creation of new products and processes.

The wave of mergers, acquisitions and strategic alliances has gone in tandem with a radical change in developed countries towards the application of competition rules to licensing arrangements. An increasing number of measures, which used to be considered restrictive business practices, are no longer challenged under competition law. Such measures are compiled in “white lists”, which include *inter alia* the refusal to grant licences, prohibition of sub-licensing, field-of-use restrictions pertaining to type (i.e. only manufacturing or distribution), technical field or product markets; restrictions relating to volume, territories or customers; time restrictions; and non-disclosure obligations.<sup>2</sup>

The third salient change in international technology markets is related to the significant broadening of the scope of protection by IPRs and the extension of patent duration. The scope and extent of IPR disciplines covered in the TRIPs Agreement (which includes patents, copyrights, trademarks and geographical indications, trade secrets and confidential information, integrated circuits design, industrial design and covering virtually all processes and products, including chemicals, alloys, pharmaceuticals, biotechnology and plant varieties) are unprecedented at the international level.<sup>3</sup> The TRIPs Agreement supplements the basic WIPO Conventions on intellectual property with substantive obligations and disciplines for WTO Parties. Many observers therefore believe that the TRIPs Agreement has reinforced the position of patent-holders by safeguarding their legal protection and by making sure that compulsory licensing would only apply in very exceptional cases.<sup>4</sup>

It should also not remain unmentioned that ToT is usually part of a much larger package, involving provisions on capital goods, intermediate products, management and marketing skills, finance and other items used for production or marketing. This allows the provider of technology to add conditions to the transfer, which are far from advantageous for the acquirer of the technology. In fact, based on the above-outlined practice in many developed countries to tolerate a good number of restrictive practices in the form of “white lists”, ToT becomes a very powerful instrument to exert pressure and control over companies, which want to acquire ESTs.

The patterns of ToT have significantly changed with respect to those prevailing until the 1980s, when local technology recipients in developing countries could enjoy advantages and apply relatively mature technologies in domestic markets with limited exposure to

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<sup>2</sup> For more information in this regard, see: Preiskel, D., Recent trends in Community IP law and no challenge clauses, *IP World*, 1 (May 1993), pp. 16-19.

<sup>3</sup> The relevance of adequate IPR protection in connection with ToT is particularly strong where high, easily imitable, technology is at stake, such as in the case of computer software or designs. If protection of such rights and of trade secrets in the potential borrowing country are weak, the source firms are unlikely to enter into transfer of technology contracts. For more information in this regard, see: Correa, C. M., *Technology transfer in the WTO agreements*, paper for the sub-regional African workshops in preparation for Seattle and ACP/EU negotiating issues, Geneva, 1999, pp. 8-9.

<sup>4</sup> Roffe, P., *From the code negotiations to the TRIPs Agreement: The unfinished agenda*, in: *International technology transfer: the origins and aftermath of the United Nations negotiations on a Draft Code of Conduct* (forthcoming UN publication).

foreign competition. The access to relatively mature technologies was obtained through equipment, technical assistance and engineering services. In recent years, however, given the key importance of technology as a competitive asset in the global market, foreign direct investment is likely to increasingly be a substitute for unbundled licensing whenever state-of-the-art technologies are involved.<sup>5</sup>

Finally, the liberalization of import regimes in most developing countries has inclined technology owners in developed countries to withhold ESTs. In the past, companies in developed countries could not export their products to developing countries with import restrictions and were therefore prepared to transfer technology to enter the market. With the removal of import restrictions they are now able to export their products directly. As a result, they are either unwilling to transfer technology or expect a high price.

### **3. Overview of the provisions on transfer of ESTs in Agenda 21**

Annex I reproduces the main provisions on the transfer of ESTs in chapter 34 of Agenda 21, entitled transfer of environmentally sound technology, co-operation and capacity-building.

The provisions in Agenda 21 on transfer of ESTs generally indicate the desire to improve the terms and conditions under which developing countries can obtain ESTs from the private sector and publically held technological knowledge in developed countries. Implicitly, Agenda 21 highlights the desire of many developing countries to search for terms of ToT, which differ from those dictated by international technology markets. This concerns the following terms and conditions:

- S removing barriers to the transfer of privately owned ESTs from developed countries and creating specific fiscal and other incentives to encourage such transfer;
- S purchase of patents and licences on commercial terms by multilateral institutions for their transfer to developing countries on non-commercial terms, as part of development co-operation for sustainable development;
- S preventing the abuse of IPRs, including rules on their acquisition through compulsory licensing, with the provision of equitable and adequate compensation;
- S provision of financial resources to acquire ESTs that would impose a special or abnormal burden upon developing countries.

The provisions in Agenda 21 also place emphasis on regularly analyzing government policies, including subsidies, tax policies and regulations to determine whether they encourage or impede the access to, transfer of and introduction of ESTs by developing countries.

### **4. The provisions on transfer of ESTs in Multilateral Environmental Agreements**

Annex II contains a survey of the provisions on transfer of ESTs in the relevant Multilateral Environmental Agreements (MEAs): The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and

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<sup>5</sup> Correa, C.M., Technology transfer in the WTO Agreements, background paper for the sub-regional African workshops in preparation for Seattle and ACP/EU negotiating issues, UNCTAD, Geneva, 1999, p. 16.

Pesticides in International Trade; the Montreal Protocol on Substances that Deplete the Ozone Layer; the Convention on Biological Diversity; and the UN Framework Convention on Climate Change and its Kyoto Protocol.

A coarse survey of the provisions on transfer of ESTs in these MEAs reveals that there are agreements with very specific and elaborate provisions, and others with rather general and tenuous ones. The latter concerns the Basel and Rotterdam Conventions, whereas the former concerns the UN Framework Convention on Climate Change (UNFCCC), the Montreal Protocol (MP) and the Convention on Biological Diversity (CBD). With probably the exception of CBD, the specificity of the provisions on ToT seems to be closely linked to the political interest of developed countries in the MEAs. It is obvious that in certain MEAs, developed countries are seeking collaboration and concessions from developing countries to address global environmental problems, which have significantly been caused by environmentally unsustainable practices in developed countries. This constellation has strengthened the bargaining position of developing countries and given them an opportunity to push through specific demands in the area of transfer of ESTs. In fact, strict reciprocity was built into the UNFCCC, MP and CBD, making the implementation of agreed obligations by developing countries dependent upon the effective implementation by developed countries of the financial co-operation and transfer of technology provisions (Art. 5.5. of MP; Art. 20.4. of CBD; and Art. 4.7. of UNFCCC ).

The CBD seems to be an agreement, in which both developed and developing countries have a common and strong interest. Despite the built-in reciprocity, the provisions on ToT related to assisting in the conservation and sustainable use of biological diversity (Art. 16.1. and 16.2.) are weaker than those linked to the use of genetic resources in developing countries (Art. 16.3.). Several observers attribute this to the fact that developed country parties are interested not only in the conservation of biodiversity, but also in utilizing the biological resources in developing countries.<sup>6</sup>

Conversely, the provisions on ToT in the Basel Convention (BC) and the Rotterdam Convention (RC)<sup>7</sup> are very general and do not contain any reciprocity. The regional and sub-regional centers for training and technology transfer, planned to be set up pursuant to Art. 14.1. of the BC, have the potential to become an integrated approach to ToT, which might include provision on finance, training, investment and regional information clearing houses. Such centers could focus on the information needs of the end users of ESTs, in particular developing countries, and also review suitable macro-economic incentives to enhance full use of acquired ESTs by developing country firms. However, the viability of this step in the right direction is undermined by weak provisions on financial mechanisms in the BC and the inadequacy of the financial resources made available so far.

The operating costs for the first two years of the 13 centers planned to be created by the BC worldwide was estimated to be about 6.5 million US dollars.<sup>8</sup> A technical co-operation trust fund to support developing countries was created pursuant to decision 7.5. of the first Conference of the Parties. However, with an annual size of about 1.5 million US

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<sup>6</sup> Beyerlin, U. and T. Marauhn, *Law-making and law-enforcement in international environmental law after the 1992 Rio Conference*, Research reports of the Max Planck Institute for Comparative Public Law and International Law, No.4, Heidelberg, 1997.

<sup>7</sup> The RC is not in effect yet and will therefore not be further reviewed here.

<sup>8</sup> UNEP/CHW/C.1/3/6.

dollars, the trust fund is much inferior to the funding needs of the centers; only about \$400,000 dollars are envisaged to be released for supporting the regional and sub-regional centers annually.<sup>9</sup> Although a number of OECD countries provided funding support to the centers on a bilateral basis, the financial sustainability of most centers has been considered fragile. Recognizing this dilemma, a number of OECD countries have been preparing a decision for the next CoP in December 1999 that calls for refocusing the work of the Convention in the next decade on the development of tools to assist developing countries to manage hazardous waste in an environmentally sound manner. To mitigate funding problems, the decision *inter alia* suggests that Parties should seek access to funding from the Global Environment Facility (GEF).<sup>10</sup>

In general, it can be concluded that the provisions on transfer of ESTs in MEAs have neither affected nor in any manner influenced the prevailing contractual terms and conditions for ToT in open technology markets. MEA provisions have rather circumvented the highly controversial issues by establishing funding mechanisms through which certain ESTs could be obtained on a commercial basis against grants from funding mechanisms of MEAs. The added value of ToT regimes in MEAs in the evolution of the norms and principles relating to international technology transfer are therefore marginal. Their main thrust lies in the interaction between financial and technology transfer mechanisms.<sup>11</sup>

As far as IPRs are concerned, the MEA provisions on ToT are ambivalent. This is best illustrated by Art. 16 of the CBD. Article 16.2. states that access to and transfer of technology “shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed”. Conversely, it emphasizes that for technology, which is protected by IPRs, “such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights.” Art. 16.3. directly links the provision of IPR protected technology with the financial mechanism created pursuant to Art. 20 and 21. At the same time, Art. 16.5. calls upon Parties that they “shall co-operate (subject to national legislation and international law in this regard) ... in order to ensure that such rights are supportive of and do not run counter to” the objectives of the Convention. Although this appears to be a binding obligation, it is weakened by the reference to national and international law, which implies the full recognition of the provisions of the TRIPS Agreement and other national patent laws.

In fact, there has been no case of compulsory licensing of ESTs and there has also been no attempt to collectively acquire ESTs, whose use was mandated by MEAs, on a commercial basis and transfer them to developing countries on non-commercial terms.

Although the link between financial mechanisms in MEAs and ToT has been the most promising and effective avenue for transferring ESTs to developing countries, the availability of adequate financial resources has been a source of considerable dispute. On the one hand, incremental costs related to ToT have been made subject to conditions such as “mutually agreed”, “where necessary” (Art. 16.2. of CBD) or “all agreed costs” (Art. 10.1. of MP) in

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<sup>9</sup> UNEP/CHW.C.1/4/26.

<sup>10</sup> UNEP/CHW/C.1/4/CRP.1.

<sup>11</sup> Yusuf, A.A., Transfer of technology in the Global Environmental Agreements: A new twist to the North-South debate, in: International technology transfer: the origins and aftermath of the United Nations negotiations on a Draft Code of Conduct (forthcoming UN publication).

the text of the conventions, which give developed countries considerable flexibility in determining funding support. On the other hand, decisions of the CoPs on categories of incremental costs (as called for in Art. 10.1. of MP) do also allow developed countries to exclude certain adjustment costs from eligible funding support.

## **5. Results of empirical studies**

A recent study on the experience of 64 companies in India with the transfer of ESTs in the context of three MEAs (Montreal Protocol, UNFCCC and CBD) comes to the following conclusions:<sup>12</sup>

If technology is embodied in the capital equipment, ToT can easily take place through FDI. The provisions of the Montreal Protocol and other conventions have been most supportive of this kind of transfer. However, this form of transfer may not lead to any effective dissemination of technologies as TNCs normally demand 100% equity in order to limit the dissemination of this form of technology.

If the technology is not easily copiable, such as a systems technology, and if the technology supplier is unwilling to transfer the technology, nothing much can be done about it. With or without IPRs, with or without provisions on ToT in MEAs, it is impossible to access these technologies. In these cases, it is important to ask for technology development funds from financial mechanisms set up within the framework of MEAs. However, while several MEAs have funding mechanisms, there is no dedicated funding for technology development and it is important to factor this in the negotiations for future MEAs.

In the case of easily copiable technologies and product patents especially for pharmaceuticals, biological products etc, IPRs are a barrier to technology dissemination. In this case it is important to use the compulsory licensing provisions and ease mechanisms for using them in the framework of the TRIPs Agreement. The provisions of Article 27.2. and 27.3 are especially relevant in this context.

A lot of technologies are in public domain but cannot be operationalised because of lack of knowledge on them and/or their unsuitability for developing countries. In these cases public private partnerships are valuable instruments and should be built in the framework of MEAs and TRIPs for technologies which are publicly funded. Joint developed and developing country partnership programmes spurred by GEF and other supportive institutions would be of great help in this connection.

## **6. Measures and instruments which might further facilitate the transfer of ESTs**

First, before turning to the measures, which may facilitate the transfer of ESTs, it is important to bear in mind two issues, which bear on access to and effective use of ESTs. On the one hand, it should not be overlooked that trade restrictions or bans applied in the context of MEAs tend to inhibit commercial forms of ToT. Financial mechanisms of MEAs and effective forms of technical assistance to developing countries will have to compensate for this defect. On the other hand, opportunities that are opened by various channels of ToT will

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<sup>12</sup> Ghayur Alam, A study on the transfer of environmentally sound technologies to India, paper presented at the seminar on "Assessing Environment-friendly Technologies within the Context of MEAs", Bangalore, India, 15 October 1999.

be more and more confined to those countries and companies that are able to develop their own technological capabilities. Therefore, creating an enabling economic environment for the further development of indigenous technological capacities is of utmost importance for developing country governments.<sup>13</sup>

Second, in further developing MEA provisions on ToT it is important that developing countries insist on the need to strike a proper balance between private party autonomy in the light of IPR protection and public interest in achieving certain environmental goals. IPRs should not be allowed to prevent required ToT or lead to ToT under unacceptable terms and conditions. Developing countries should therefore not hesitate invoking the reciprocity provisions in MEAs, which explicitly include technology transfer in the case of the MP, CBD and UNFCCC. In this regard, reference can also be made to Article 8.2. and 31 (k) of the TRIPs Agreement, which deal with licensing practices which may have adverse effects on trade or on competition and which member countries may control through appropriate measures (Article 40).

Third, as recommended by the Ministerial Meeting of the Group of Fifteen in preparation for the Seattle Ministerial Conference of WTO, held in Bangalore, India, in August 1999, developing countries should insist that in cases of proprietary technologies or substances mandated for use by international agreements or national environmental laws, owners of IPRs should be required to sell them at fair and most favourable terms and conditions.<sup>14</sup> Unless this is the case, mandatory licensing should be considered. As accepted under many national laws, a license may be granted for “refusal to deal”, when the patent holder has refused to grant a voluntary license on reasonable commercial terms, particularly when this prejudices the development or establishment of a commercial or industrial activity or the supply of an export market (see, for instance, UK patent law article 48.3.d).

Fourth, India tabled a proposal on ToT for the Seattle meeting suggesting that a qualifier should be made in the Subsidies Agreement regarding incentives for ToT from developed to developing countries. “It could be made clear that subsidies incurred in developed countries for ensuring ToT to developing countries shall be deemed non-actionable. There is at present a contradiction inasmuch as there are some subsidies on R&D that are not actionable, but then there are domestic legal provisions in some major countries that impede the transfer of that very technology to developing countries. This anomaly would need to be removed.”<sup>15</sup>

Fifth, although the provision of incentives by developed countries to enterprises and institutions to promote technology transfer to developing countries is prefaced by a “shall” in Art. 66.2 of the TRIPs Agreement, in the TRIPs Council developed countries have so far declined to disclose the details of incentives given and any monitoring they do to follow it up. Therefore, the provisions of incentives in Art. 66.2 shall be made mandatory and subject to periodic notifications to and monitoring by the TRIPs Council of their effective implementation. The provisions should also be extended to all developing countries.

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<sup>13</sup> Lall, S., Science and technology in the new global environment: Implications for developing countries, UNCTAD, Science and Technology Issues, Geneva, 1995, p. 21.

<sup>14</sup> Bridges, Vol. 3, No. 6 (July-August 1999), Geneva, p. 12.

<sup>15</sup> Communication by India to the WTO secretariat on transfer of technology, Indian Mission to WTO, Geneva, 4 October 1999, p. 4.

Sixth, the supply of technical and financial co-operation for developing and least-developed countries is mentioned in Art. 67 of the TRIPs agreement, but no specific obligations or operative mechanisms are provided for. The provision of such assistance is on request and subject to mutually agreed terms and conditions. The Article states that “such co-operation shall include assistance in preparation of laws and regulations on the protection and enforcement of IPRs as well as on the prevention of their abuse, and shall include support regarding the establishment or reinforcement of domestic offices and agencies relevant to these matters, including the training of personnel.” The further review of the TRIPs Agreements should be used to further specify the obligations under this article.

In general, however, it should be observed that though some WTO Agreements may be improved or supplemented on ToT, they provide a too narrow framework to comprehensively deal with the issues at stake in ToT, particularly if the aim is to increase access to ESTs under private control.<sup>16</sup>

Seventh, there is room for improving existing environmental information systems, rather than building new ones. Establishing regional information clearing houses, for instance, can be a first step towards establishing a network of ESTs under each MEA. The need for technology clearing houses is more immediate where there are multiple technological options for implementing an MEA. Regional centers could focus on information needs of end users. The Ozone Action Clearing House and the Centers on Training and Technology Transfer of the Basel Convention are such examples. Developing country governments have to remain vigilant, however, that such centers do not become too bureaucratic.

Eighth, based on various economic incentives, developing country governments should encourage the private sector to forge business partnerships with companies and industry associations in developed countries in order to facilitate ToT. A number of international industry associations in environmental sensitive industries, such as metals or chemicals, have special programmes on reducing human and environmental exposure to contaminants, which include assistance to developing countries. Their information clearing house, technical and advisory services can be highly useful in facilitating access to ESTs and their effective use. The lead battery recycling industry in the Philippines, for example, currently profits from a joint project of UNCTAD and the International Lead Management Center (ILMC), in which the latter provides technical advice to Philippine battery recyclers on suitable ESTs for enhancing environmental performance.<sup>17</sup> This advice includes the support of small- and medium-sized companies.

Ninth, developing countries should modify ToT provisions in MEAs calling for the promotion of access to publicly held or funded ESTs in developed countries. The objective should be to launch joint research programmes, for example between academic research institutes and laboratories in developed and developing countries, and facilitate the regular exchange of scientists. There is also ample opportunity for more South-South co-operation in the area of publicly sponsored ESTs. A recent survey provides an extensive list of activities undertaken in a cross section of developing countries to address climate change within

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<sup>16</sup> See: Correa, C.M., *op.cit.*, p. 17.

<sup>17</sup> For more information in this regard, see: [www.ilmc.org](http://www.ilmc.org)

national development strategies.<sup>18</sup> Similarly, the Republic of Korea has developed alternative technologies for chlorofluorocarbons (CFCs) with public funds. To ensure wider dissemination of such ESTs, one possible mechanism could be the creation of a “Southern” technology bank, where technologies could be banked and “lent” on preferential and non-commercial terms. Such bank should get sufficient funding support from financial mechanisms of MEAs and might also attract World Bank funding.

The access to technologies developed with public support<sup>19</sup> is however limited for foreigners in some developed countries, such as in the United States. According to US law, exclusive licenses cannot be granted unless the licensee agrees that any product embodying the invention or produced through the use of the invention will be substantially manufactured in the US. Furthermore, the Guidelines on University Technology Transfer, developed by the US Council on Governmental Relations, provides that universities should be extremely cautious in considering foreign licensees, especially if the research was funded by the US Government.<sup>20</sup>

Tenth, developing countries might take advantage of some new, market-based instruments, which may facilitate access to ESTs. Particularly promising in this regard is project-related investment in greenhouse gas emission reduction projects with the framework of the Clean Development Mechanism (CDM) created by Art. 12 of the Kyoto Protocol. In this context, greenhouse gas emitting companies in developed countries can invest in project activities in developing countries, which lead to certified greenhouse gas emission reductions, that, based on the future rules of the CDM, can then be used by the investor in his home country to meet the greenhouse gas emission limitations or reductions agreed upon by this country under the Kyoto Protocol.<sup>21</sup> For minimizing emissions, it is reasonable to assume that companies in developed countries will attempt to deploy modern technology in such projects in developing countries, including necessary efforts in building technical and managerial capacity. The industrial sectors, which will most likely benefit from such projects, are energy generation, transport, energy-intensive production and manufacturing sectors (such as metal production and processing) and waste management.

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<sup>18</sup> IVAM Environmental Research, Pilot information needs survey regarding climate change relevant technologies, University of Amsterdam, 1997.

<sup>19</sup> The US Federal Government financed no less than 34 per cent of all R&D expenditure in the US in 1996. Callan, B/Costigan, S./Keller, K., *Exporting US high tech – facts and fiction about the globalization of industrial R&D*, Council of Foreign Relations, New York, 1997, p. 8.

<sup>20</sup> For more information in this regard, see: Eisenberg, R., *Ownership, commercial development, transfer and use of publicly-funded research results: The US legal regime*, UNCTAD, Geneva, 1997.

<sup>21</sup> Such certified emission reduction units may also enter the international emissions trading market.

## ANNEX I

### Provisions on the Transfer of ESTs in AGENDA 21, adopted in June 1992

#### Chapter 34

#### Transfer of Environmentally Sound Technology, Co-operation and Capacity-building

##### Objectives

**34.14** The following objectives are proposed:

- (a) To help to ensure the access, in particular of developing countries, to scientific and technological information, including information on state-of-the art technologies;
- (b) To promote, facilitate, and finance, as appropriate, the access to and the transfer of environmentally sound technologies and corresponding know-how, in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries for the implementation of Agenda 21;
- (c) To facilitate the maintenance and promotion of environmentally sound indigenous technologies that may have been neglected or displaced, in particular in developing countries, paying particular attention to their priority needs and taking into account the complementary roles of men and women;
- (d) To support endogenous capacity-building, in particular in developing countries, so they can assess, adopt, manage and apply environmentally sound technologies. This could be achieved through *inter alia*:
  - (i) Human resource development;
  - (ii) Strengthening of institutional capacities for research and development and programme implementation;
  - (iii) Integrated sector assessments of technology needs, in accordance with countries' plans, objectives and priorities as foreseen in the implementation of Agenda 21 at the national level;
- (e) To promote long-term technological partnerships between holders of environmentally sound technologies and potential users.

##### B) Support of and Promotion of Access to Transfer of Technology

**34.18** Governments and international organizations should promise, and encourage the private sector to promote, effective modalities for the access and transfer, in particular to developing countries, of environmentally sound technologies by means of activities, including the following:

- (a) Formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain;
- (b) Creation of favourable conditions to encourage the private and public sectors to innovate, market and use environmentally sound technologies;
- (c) Examination by Governments and, where appropriate, by relevant organizations of existing policies, including subsidies and tax policies, and regulations to determine whether they encourage or impede the access to, transfer of and introduction of environmentally sound technologies
- (d) Addressing, in a framework which fully integrates environment and development, barriers to the transfer of privately owned environmentally sound technologies and

- adoption of appropriate general measures to reduce such barriers while creating specific incentives, fiscal or otherwise, for the transfer of such technologies;
- (e) In the case of privately owned technologies, the adoption of the following measures, in particular for developing countries;
    - (i) Creation and enhancement by developed countries, as well as other countries which might be in a position to do so, of appropriate incentives, fiscal or otherwise, to stimulate the transfer of environmentally sound technology by companies, in particular to developing countries, as integral to sustainable development;
    - (ii) Enhancement of the access to and transfer of patent protected environmentally sound technologies, in particular to developing countries;
    - (iii) Purchase of patents and licenses on commercial terms for their transfer to developing countries on non-commercial terms as part of development cooperation for sustainable development, taking into account the need to protect intellectual property rights;
    - (iv) In compliance with and under the specific circumstances recognized by the relevant international conventions adhered to by States, the undertaking of measures to prevent the abuse of intellectual property rights, including rules with respect to their acquisition through compulsory licensing, with the provision of equitable and adequate compensation;
    - (v) Provision of financial resources to acquire environmentally sound technologies in order to enable in particular developing countries to implement measures to promote sustainable development that would entail a special or abnormal burden to them;
  - (f) Development of mechanisms for the access to and transfer of environmentally sound technologies, in particular to developing countries, while taking into account development in the process of negotiating an international code of conduct on transfer of technology, as decided by UNCTAD at its eighth session, held at Cartagena de Indias, Colombia, in February 1992.

## **Annex II**

### **Survey of Provisions on Transfer of ESTs in Selected Multilateral Environmental Agreements**

#### **BASEL CONVENTION, 1989**

##### **Art. 10.2.**

- (c) co-operate, subject to their national laws, regulations and policies, in the development and implementation of new environmentally sound low-waste technologies and the improvement of existing technologies with a view to eliminating, as far as practicable, the generation of hazardous wastes and other wastes and achieving more effective and efficient methods of ensuring their management in an environmentally sound manner, including the study of the economic, social and environmental effects of the adoption of such new or improved technologies;
  - (d) co-operate actively, subject to their national laws, regulations and policies, in the transfer of technology and management systems related to the environmentally sound management of hazardous wastes and other wastes. They shall also co-operate in developing the technical capacity among Parties, especially those which may need and request technical assistance in this field;
3. The Parties shall employ appropriate means to co-operate in order to assist developing countries in the implementation of subparagraphs a, b, c and do of paragraph 2 ....

##### **Art. 14.1**

The Parties agree that, according to the specific needs of different regions and subregions, regional or sub-regional centres for training and technology transfers regarding the management of hazardous wastes and other wastes and the minimization of their generation should be established. The Parties shall decide on the establishment of appropriate funding mechanisms of a voluntary nature.

##### **Decision I/7.5**

Invites the SG of the United Nations to establish .... a technical cooperation trust fund to support developing countries and other countries in need of technical assistance in the implementation of the Basel Convention ...

#### **ROTTERDAM CONVENTION (on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade), 1998**

##### **Art. 16**

The Parties shall, taking into account in particular the needs of developing countries and countries with economies in transition, co-operate in promoting technical assistance for the development of the infrastructure and the capacity necessary to manage chemicals to enable implementation of this Convention. Parties with more advanced programmes for regulating chemicals should provide technical assistance, including training, to other Parties in developing their infrastructure and capacity to manage chemicals throughout their life-cycle.

## **MONTREAL PROTOCOL** (on Substances that Deplete the Ozone Layer), 1987

### **Art. 10A**

Each Party shall take every practicable step, consistent with the programmes supported by the financial mechanism, to ensure:

- (a) that the best available, environmentally safe substitutes and related technologies are expeditiously transferred to Parties operating under paragraph 1 of Article 5<sup>22</sup>; and
- (b) that the transfers referred to in subparagraph (a) occur under fair and most favourable conditions.

### **Art. 10**

1. The Parties shall establish a mechanism for the purposes of providing financial and technical co-operation, including the transfer of technologies .... The mechanism ... shall meet all agreed incremental costs of such Parties in order to enable their compliance with the control measures of the Protocol. An indicative list of the categories of incremental costs shall be decided by the meeting of the Parties.
2. The mechanism established under paragraph 1 shall include a Multilateral Fund. It may also include other means of multilateral, regional and bilateral co-operation.
3. The Multilateral Fund shall:
  - (a) meet, on a grant or concessional basis as appropriate, and according to criteria to be decided upon by the Parties, the agreed incremental costs.

### **Art. 5**

5. Developing the capacity to fulfil the obligations of (developing countries) Parties ... will depend upon the effective implementation of the financial co-operation as provided by Article 10 and the transfer of technology as provided by Article 10A.
6. Any (developing country) Party ... may, at any time, notify the Secretariat in writing that, having taken all practicable steps it is unable to implement any or all of the obligations laid down in Articles 2A to 2E, or any or all obligations in Articles 2F to 2H<sup>23</sup> ... due to inadequate implementation of Articles 10 and 10A. The Secretariat shall forthwith transmit a copy of the notification to the Parties, which shall consider the matter at their next meeting, giving due recognition to paragraph 5 of this Article and shall decide upon appropriate action to be taken.
7. During the period between notification and the meeting of the Parties at which the appropriate action referred to in paragraph 6 above is to be decided, or for a further period if the meeting of the Parties so decides, the non-compliance procedures referred to in Article 8 shall not be invoked against the notifying Party.

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<sup>22</sup> Developing countries with a per capita consumption of 0.3 kg of the controlled substances in Annex A (i.e. CFCs and halons).

<sup>23</sup> These articles outline the adjustments and reductions of production and consumption of controlled substances (CFCs, halons, other fully halogenated CFCs, carbon tetrachloride, methyl chloroform, hydrochlorofluorocarbons, hydrobromofluorocarbons, and methyl bromide).

## **CONVENTION ON BIOLOGICAL DIVERSITY, 1992**

### **Art. 16**

1. Each Contracting Party ... undertakes ... to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.
2. Access to and transfer of technology referred to in paragraph 1 above to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed, and, where necessary, in accordance with the financial mechanism established by Articles 20 and 21. In the case of technology subject to patent and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. The application of this paragraph shall be consistent with paragraphs 3,4, and 5 below.
3. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patent and other intellectual property rights, where necessary, through the provisions of Articles 20 and 21 and in accordance with international law and consistent with paragraphs 4 and 5 below.
4. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology referred to in paragraph 1 above for the benefit of both governmental institutions and the private sector of developing countries and in this regard shall abide by the obligations included in paragraphs 1, 2 and 3 above.
5. The Contracting Parties, recognizing that patent and other intellectual property rights may have an influence on the implementation of this Convention, shall co-operate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.

### **Art. 18**

3. The Conference of the Parties, at its first meeting, shall determine how to establish a clearing-house mechanism to promote and facilitate technical and scientific co-operation.
5. The Contracting Parties shall, subject to mutual agreement, promote the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of the Convention.

### **Art. 20**

2. The developed country Parties shall provide new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs to them of implementing measures which fulfil the obligations of this Convention and to benefit from its provisions and which costs are agreed between a developing country Party and the institutional structure referred to in Article 21 (Financial Mechanism), in accordance with policy, strategy, programme priorities and eligibility criteria and

an indicative list of incremental costs established by the Conference of the Parties... The implementation of these commitments shall take into account the need for adequacy, predictability and timely flow of funds and the importance of burden-sharing among the contributing Parties included in the list.

4. The extent to which developing country Parties will effectively implement their commitments under this Convention will depend on the effective implementation by developed country Parties of their commitments under this Convention related to financial resources and transfer of technology and will take fully into account the fact that economic and social development and eradication of poverty are the first and overriding priorities of the developing country Parties.
5. The Parties shall take full account of the specific needs and special situation of least developed countries in their actions with regard to funding and transfer of technology.

## **UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 1992**

### **Art. 4**

1. (c) Promote and co-operate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors.
5. The developed country Parties and other developed Parties included in Annex II 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. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties...
7. The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

### **Art.11**

1. A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria related to this Convention. Its operation shall be entrusted to one or more existing international entities.
3. (d) Determination in a predictable and identifiable manner of the amount of funding necessary and available for the implementation of this Convention and the conditions under which that amount shall be periodically reviewed.

## **KYOTO PROTOCOL** (to the UN Framework Convention on Climate Change), 1997

### **Art.3**

- 14.** Each Party included in Annex I<sup>24</sup> shall strive to implement the commitments mentioned in paragraph 1 above<sup>25</sup> in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties ... In line with relevant decisions of the Conference of the Parties on the implementation of those paragraphs, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.

### **Art.10**

- (c)** Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies.

### **Art.11**

- 2.(b)** Also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1,<sup>26</sup> of the Convention that are covered by Article 10 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention<sup>27</sup>, in accordance with that Article.

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<sup>24</sup> Developed countries and countries with economies in transition.

<sup>25</sup> Quantified emission limitation or reduction commitments contained in Annex B of the Protocol.

<sup>26</sup> Parties which jointly fulfil their emission reduction commitments.

<sup>27</sup> On the financial mechanism.