

Mechanisms to promote development and dissemination of clean and environmentally sound technologies in Africa

Brief overview

This brief suggests the establishment of a mechanism that can help countries develop as well as identify, source, adapt and utilize existing and emerging clean and environmentally sound technologies. Given the limited human, financial, institutional and technological resources of the continent, we suggest the creation of a regional network of centres of excellence and hubs leveraging of existing networks and institutional arrangement to assess the needs and to identify, develop, adapt and transfer clean technologies. Such a mechanism will offer a multidisciplinary approach to development and dissemination of clean and environmentally sound technologies and thus may have need a number of institutional arrangements, partners and support measures.

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Mechanisms to facilitate environmentally friendly technology development and transfer

Africa has a small but growing base of research and development (R&D) institutions and an emerging and dynamic private sector. To promote development of clean and environmentally sound technologies, there is a need to encourage interactions among knowledge and skills producers (largely academia), knowledge users and product/service providers (industry) and regulators/policy makers (government). This is important as Africa's private sector is not yet investing in R&D. Commonly referred to as the "Triple Helix" of University-Industry-Government, several countries have already considered ways of encouraging such partnership arrangements.

For instance, South Africa's Innovation Hub (The Hub) is supported by the government and strategically located between two of the country's premier scientific and industrial research institutions (the University of Pretoria and the Council for Scientific and Industrial Research (CSIR) and Pretoria university) to promote the flow of knowledge between The Hub's tenant (industry) and the centres of knowledge generation (academia). The number of industrial and economic zones, technology incubators, business parks and entrepreneurship hubs in Africa is rising rapidly. These could serve as vehicles for promoting the development and dissemination of technology.

Governments will need to put in place the necessary support policies and legal frameworks that will encourage both academia and industry to collaborate. This may include competitive funding that requires collaboration between academia and industry, regulation that encourage the development and adoption of clean technologies by firms, the appropriate intellectual property rights that balance the interests of technology developers and users and a common platform for sharing and exchanging and knowledge and best practices.

However, once the technology is developed it has to be transferred. The process of transfer of technology is composed of varies steps: 1. Identification of the need and the technology of interest; 2. The potential sources, costs and negotiations to gain access; 3. The actual transfer of the technology, 4. Adaptation and learning to operate and maintain the technology and; 5. The use and further upgrade of the acquired technologies. The technology can only be said to be successfully transferred if the importing/buying party is able to use it and achieve the desired results (e.g. manufacture product or deliver the service).

Technology transfer should not be viewed as a single event but rather a sequence of activities from sourcing to successful utilization of the technology. It is for this reason that several public and private institutions have established technology transfer offices, units and agencies to oversee the process of transferring technology and related knowledge assets. This systems work very well for a number of transactions around a give set of technologies.

Experience at the international level has shown that successful transfer of environmentally sound technologies requires a similar arrangement. For instance, the transfer of technology to eliminate the use of ozone depleting substances under the Montreal Protocol has been partly successful because it

focused on technologies around a limited challenge (e.g. ozone depleting chemicals) which made identification and sourcing such technologies possible, a funding mechanism to meet some of the costs associated with technology transfer and a technical advisory body that provided impartial advice. A similar mechanism seems to have worked in the transfer of knowledge to monitor transboundary movements of genetically modified organisms (GMOs) under the Cartagena Protocol of the UN Convention on Biological Diversity (CBD).

Unlike the above cases, clean technologies touch all aspects of society- the way products and people are transported, energy and food is produced, and how water is processed and waste disposed, to mention a few. The target is much broader than in the examples above and presents a unique challenge. This is similar to the challenge of implementing Article 66.2 of the TRIPS Agreements of the World Trade Organization on the transfer of technologies to build a sound technological and industrial base in least development countries (LDCs).

Possible mechanisms and partners

In terms of Africa, it is important to establish a mechanism that can help countries identify, develop, source, adapt and utilize existing and emerging technologies. Given the limited human, financial and technological resources of the continent, here we suggest the creation of a regional network of centres of excellence and hubs, leveraging of existing networks and institutional arrangement. Such a mechanism offer a multidisciplinary approach to development and dissemination of clean and environmentally sound technologies and thus may require the use of a number of institutional arrangements, partners and support measures.

1. Institutional arrangements

A. Independent advisory board

There is a need for the United Nations to have an advisory board drawing on its various agencies to provide different perspectives on technology development, transfer and use. As system-wide approach to development, transfer and use of clean technology will enable the United Nation to coordinate its activities across its agencies.

This could form part of the work programme of the United Nations Cluster on Science and Technology, as part of the Regional Coordination Mechanisms, and the African Cluster of Science and Technology that focus on the Science and Technology Consolidated Plan of Action (CPA) of African Union and NEPAD. Both mechanisms already exist and could help coordinate and inform work in this area.

B. Regional steering committee

A steering committee that specifically focuses on development, dissemination and use of clean technology may be constituted of selected institutions that are currently involved in promoting technology transfer across a variety of social and economic activities. There are several networks involved in agriculture, energy, environmental and health as well as others that are generic in nature.

This committee is much closer to the ground than the UN system-wide advisory board and could be instrumental in screening possible sources, brokering technology transfer deals and harmonization of costs associated with technology. It can also serve as a regional platform for sharing good practices.

Partners that already promote technology development and transfer and have experience in brokering technology transfer arrangements include:

African Technology Development and Transfer Network (TDTNet) of UNECA, African Agriculture Technology Foundation (AATF), Alliance for a Green Revolution in Africa, African Renewable Energy Alliance and the African Network for Drug and Diagnostic Innovation (ANDI). The representatives of these networks could form a steering committee that may be supported by a few independent experts.

C. Networks of centres of excellence and hubs

A regional network of centres of excellence could be selected and will help undertake the technology needs assessment of countries, participate in the development of technologies and capacity-building efforts, and adapt and diffuse the target technologies. The centres of excellence can leverage each other's human, financial and institutional resources and collaborate in R&D and training activities necessary to successfully develop, transfer and use the technologies at the national and firm/institutional level. National technology transfer offices, development agencies and training agencies may form part of the implementing units at the national level.

Potential partners include the NEPAD Biosciences Hubs, the ANDI network of centres of excellence, members of the African Technology Development and Transfer (TDTNet) of UNECA and the Pan African University centres of the African Union. All of which already exist.

2. Support mechanisms

A Funding mechanisms

A competitive funding mechanism, especially for least developed countries, may support the costs associated with technology development and transfer activities. These may include training and any royalties and licensing fees where the owners of the technologies may not be willing to waive the costs associated with clean technology transfer.

Options for implementation: A trust fund for technology development and transfer may have to be created at UNECA or the African Development Bank to support the activities of the network. Countries with their own funds may call on the network to help them undertake any of the above activities.

B Capacity building

Capacity building may involve training of public and private institutions and individuals, creating awareness and industrial technology assessment. The traditional technology needs assessment looks at what technologies the countries need while industrial technology assessment will focus on

technologies that the firms and institutions are currently using, estimating the costs of replacing such technologies and the benefits of cleaner technologies in economic and social terms.

The centres of excellence could provide such training support and will draw from a variety of resources.