

CHAPTER EIGHT

FINANCIAL ASSISTANCE AND TECHNOLOGY TRANSFER



Solar Energy Technology

8.1 RELEVANT CONVENTION ARTICLES

In carrying out the commitments under the Convention, Guyana recognizes the importance of actions which have to be taken by Guyana and by the developed Country Parties in order for the country to be able to implement mitigation and adaptation measures. The articles of relevance are:

- Article 4.1 (b) - Parties to undertake programmes to mitigate climate change and facilitate adequate adaptation to climate change.
- Article 4.1 (c) - Parties to cooperate in the transfer of technologies, practices and processes that control, reduce or prevent ghg emissions in all relevant sectors including energy, transport, industry, agriculture, forestry and waste management sectors.
- Article 4.5 - The developed Country Parties and other Annex II developed Parties shall promote, facilitate and finance 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.

8.2 THE NEED FOR ASSISTANCE

Guyana has a highly developed low lying coastal area, several populated small islands, forested and savannah areas. It is a country susceptible to serious droughts, with regions having fragile ecosystems and its economy is highly dependent on income generated from the utilization of fossil fuels. It is a developing country, which has specific needs and special situations such as a vulnerable coastal plain where over 90% of the populations reside. Funding and transfer of technology are therefore required to address critical adaptation issues as well as mitigation programmes.

The capacity and institutional base of government (including local government), private sector, other NGOs, scientific and professional groups and communities are weak and will require assistance to build up the human, organizational, information assessment and monitoring capacity. These capacity building needs are addressed in the following sections.

8.2.1 Capacity Building Needs

Capacity building is required at all stages in the process of technology transfer. The Government of Guyana is committed to ensure that programmes are fully supported by the governmental agencies. However, the capacity in terms of human, organizational and information assessment is weak. While it is recognized that effective technology transfer requires efficient networking, the weak capacity prevents an advance towards effective communication of technologies and understanding of their usefulness in Guyana. It is therefore critical to address the building of capacity in the governmental and private sector institutions, while at the same time improving the networking of these institutions in order to effect efficient and useful sharing of information on technologies, demonstrated capabilities of technologies, etc.

8.2.1.1 Human Capacity

Technical, business and regulatory skills are very limited in Guyana. Capacity is required to assess, select, import, develop and adapt appropriate technologies. This can be tackled by formal training of local personnel; formation of links with other enterprises, trade, research and professional organizations; and through operational experiences with other firms.

It is the view that an initial technology needs assessment is required to be done. This assessment should examine the current capacities of institutions, private sector, professional and scientific organizations and local communities to deal with the issues and identify what needs are required to improve the situation.

The assessment should also examine the current technologies in use in Guyana in the various sectors with a view towards assessing the efficiency of the technology; the emissions associated with the technology and identify technologies which can prove to be more climate-friendly. It will be necessary for the assessment to include possible sources of financing or investment and make recommendations on the most effective measures to be taken to address Guyana's mitigation programmes.

Since the major part of Guyana's emissions of greenhouse gases come from the energy sector, special attention should be placed on improving the efficiency of current power generation and utilization, conservation practices and on use of fuel-efficient vehicles, equipment, etc. and on energy utilization in buildings. Agriculture and forestry are also sectors which can be involved not only in reducing emissions but also in enhancing sink mechanisms. Waste Management and Human Health will also have to be considered since improved technologies in these sectors will enhance Guyana's mitigation process, improve its health system, and allow for adaptation to the adverse impacts of climate change.

8.2.1.2 Organizational Capacity

The government, the private sector and the community institutions must together be involved in development and technology transfer. The need exists for strengthening the capacity of the various agencies as well as to improve the networks in which the several agencies can contribute to the transfer of technology. The needs include physical and communications infrastructure; opportunities to develop firms for management consulting, energy services; investment and product rating and law; encouraging cooperative engagement of all sectors and agencies in environmental policy-making and project formulation and the involvement of communities in decision-making where their needs are concerned.

8.2.1.3 Information Assessment and Monitoring Capacity

There is the need to ensure that information is available and can be competently assessed to take into consideration the strength/weakness of the underlying economics, adequacy of financial services and adaptation to local conditions. There is also the need to encourage groups of companies to build technology networks.

Government needs to establish a system of improved indicators and data collection on flows of environmentally sound technologies in addition to technology performance benchmarks compilation to indicate the potential for technological improvements. Establishing linkages to international and regional networks (inclusive of private sector networks) can be done by the setting up of a technology information centre with network links to NGOs, private sector, consumer associations, professional and scientific associations and consulting firms.

8.3 BARRIERS TO THE TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES

The Government of Guyana has been addressing the matter of eliminating the barriers to trade and investment. The economy is generally a market-oriented one and there exists an open and transparent banking and trading system. Institutional corruption is also being addressed with a policy of “zero tolerance” to exposed corrupt public servants.

However, in Guyana, the most pressing obstacles are insufficient human and institutional capabilities; inadequate understanding of local needs, demands and potential for technological transfer; and the inability to access, assess, select, import, develop and adapt appropriate technologies.

The government sees the private sector as the engine for economic growth. However, the need exists for smaller firms to be able to access capital at concessionary lending rates and for the legal institutions to be supported to develop codes and standards for the evaluation of environmentally sound technologies. It is also recognized that the private sector will be slow to be involved in some types of coastal adaptation

technologies (such as sea defence infrastructure) and that the government will have to take the lead role in the acquisition and utilization of these technologies.

There are several areas in which deficiencies can be barriers to technology transfer. Inadequate capacity to collect data, information and knowledge, especially “emerging” technologies; no confidence in unproven technologies; aversion to taking risks; inadequate science, engineering and technical knowledge available to the private sector; and insufficient research and development are some of the areas of concern. In order to fully address the matter of barriers to the transfer of Environmentally Sound Technologies (EST), five categories of barriers shall be considered.

8.3.1 Economic and Financial

Guyana is a developing country now emerging from a period of poor economic and social performance. The inadequate economic base and low incomes naturally lead to low levels of savings and investment. Development and transfer of ESTs is therefore not effective. Market barriers such as lack of incentives and, in a few cases, the existence of disincentives may not be attractive to the transfer of ESTs. A fair pricing system needs to be addressed for all areas in which ESTs can be introduced so that price signal can be relied on. The size of the markets in Guyana is also relatively small thereby posing a problem to business when the low rate of return on investments is considered. Guyanese businesses are also generally averse to risk-taking and local loan providers may not be amenable to assisting in what will be viewed as risky investments.

8.3.2 Organizational and Institutional

For many of the mitigation ESTs, a favourable business environment will have to be addressed. The one-stop shop mechanism, GOINVEST, which has been established to fast-track the governmental procedures for investment projects is a positive action taken by the government. However, the business environment requires transparent legal systems, strong enforcement mechanisms for laws relating to investments and companies, short arbitration processes, clearly defined property rights, reasonable legal fees, brisk institutional actions clearly defined macro-economic policies, adequate communication capability and availability of suitable firms for subcontracting.

8.3.3 Human Resources

There is a serious lack of relevant training in Guyana. Training in project development, management and operations need to be intensified so that advanced technology can be sought and utilized. The relatively low level of technological capability in Guyana presents a major barrier to the transfer and development of technology.

8.3.4 Technological

There is a weak institutional structure to support the development and implementation of appropriate technology standards and regulations. The capability of the Guyanese people to use and manage imported hardware is lacking in this regard and this diminishes our ability to alter, improve or retrofit foreign technologies for local adaptation or to eliminate problems without unnecessary and costly recourse to suppliers.

Normal engineering procedures for testing, commissioning, trouble-shooting and supporting imported equipment are either not in place or neglected. This can pose a serious problem with renewable energy technologies by contributing to poor performance.

8.3.5 Technology Information

There is a poor technical information base in Guyana. Limited access to information affects the local capacity for effective identification and assessment of technologies. It is important to have access to international information and local data required for the design of investment projects. Performance data and banking and insurance information is needed for making decisions. Detailed information on indigenous technologies is also not available.

8.4 TECHNOLOGY NEEDS

Decision 4/CP.4 identifies several areas and sectors in which actions can be taken to implement Article 4.5 of the Convention. These are all relevant to Guyana's technology needs if the country is to comply with its commitments under the Convention. The needs are addressed under two categories: capacity building and sectoral considerations.

8.4.1 Capacity Building

- Strengthening the capacities and capabilities of government (including local government) and private sector agencies so that Guyana can contribute to the ultimate objective of the Convention and achieve sustainable development.
- Accessing support for capacity building and the strengthening of appropriate institutions in Guyana to enable the transfer of environmentally sound technologies and know-how.
- Providing assistance to Guyana in its efforts to build capacity and institutional frameworks to improve energy efficiency and utilization of renewable energies through multilateral and bilateral cooperative efforts.
- Providing assistance to Guyana to build capacity for sustainable management and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems.
- Providing assistance to Guyana to build capacity to adapt to the adverse effects of climate change.
- Providing assistance to Guyana to strengthen its endogenous capacities and capabilities in the areas of technological and socio-economic research and systematic observation relevant to climate change and its associated adverse effects.
- Cooperating in and promoting capacity building of Guyana at the international, regional, sub-regional and national levels through cooperation programmes supported by the United Nations and other multilateral agencies, as well as bilateral agencies.

8.4.2 Sectoral Considerations

8.4.2.1 Residential, Commercial and Institutional Building Sector

Energy is used in this sector to cool buildings, provide lighting and services such as cooking, computers, refrigerators, etc. Energy use efficiency and conservation in addition to the application of efficient technologies can be important. There is the need for assistance to Government to improve its capacity and strengthen its institutional capability to develop environmental standards for new buildings and equipment, information, education and labelling programmes and research, development and demonstration programmes. There is also the need to assist government and the private sector to work towards creating a market environment for the private sector to lead in the transfer of technology by decision-making on a wide range of financial and economic incentives, policies and regulations. A study is required also on how to encourage and develop community programmes by identifying needs at the level of the community and by

taking into consideration the initiatives of the community.

8.4.2.2 Transport

Energy use in this sector is almost entirely dependent on fossil fuels. The costs of technical and non-technical options are affected by availability of source, technical know-how, institutional capacity and local markets. There is the need for assistance in preparing a comprehensive study into actions which the Government of Guyana can take to address the mitigation issue in this sector. The study must include consideration of improving the quality of imported fuels, alternative fuels (including methanol and ethanol) and energy use in the airline industry.

The public transport system needs to be studied with a view towards addressing energy savings; changing the transport infrastructure and systems to reduce travel trips and increase freight volume per trip; and, to explore ways and means for cooperation with other countries to effect technology transfer. Above all, there is the urgent need for the development of a policy statement and the building of capacity to receive technology inflows.

8.4.2.3 Industry

The use of new process schemes, energy and resource efficiency, materials substitution, changes in design and manufacture of products leading to less use of material and increased recycling are all needed in the industrial sector. There is the need to know what are the technologies that are available for each type of industry and to obtain the investments needed to acquire them. Capacity building of the relevant agencies will be necessary for accessing, assessing and seeking financial assistance.

8.4.2.4 Energy Supply

Economic development and international competitiveness depends on reliable and reasonably priced energy supply. Guyana depends primarily on fossil fuel imports but the potential for using renewable sources of energy exists. It is clear that, in this sector, significant investments will be required for transfer of technology. Therefore, the role of the Government is important to facilitate technology transfer.

An energy sector policy has been developed and can be used to encourage and facilitate technology transfer in the fossil fuel sector to foster clean energy technologies, switching to lower carbon fuels and high efficiency power generation.

The greatest potential for Guyana to mitigate greenhouse gas emissions lie in the use of renewable energy sources. However, lack of investments and the high capital costs have been a hindrance to the use of “renewables”. The Government has embarked on the development of small-scale hydropower generating stations in the hinterland to cater for local communities. The potential exists for the setting up of wind farms and the use of sugarcane bagasse and rice biomass cogeneration systems. Solar power generation is another renewable source especially for small communities. There is the need to promote wind/solar-generating systems with diesel backup systems to cater for the larger communities outside of the urban areas. In order to promote the use of renewable technologies, there will have to be adequate human and institutional capacities, assessment of the potential of the renewables and the investments required to address the acquisition of the technologies.

There is the need to access coastal adaptation technologies, which are in use or have been demonstrated, to identify adaptation technology needs, examine how these technologies are developed and transferred and to seek funding for the transfer of these technologies.

8.4.2.5 Agriculture

The major crops are sugar and rice and these are important to the economy of Guyana. Adaptation to climate change will require changes in genetic stocks, improved and efficient irrigation practices, improved nutrient and water use efficiency and skillful risk management and production management practices. Mitigation measures can include carbon sequestration in soils, manure conversion to methane fuel, increased feed efficiency and reducing methane emissions from rice paddies. The mitigation measures should form part of a policy document on addressing emissions of greenhouse gases in the sector. The policy can then be implemented by way of incentives, regulations and facilitation of technology transfer. There is also the need to examine the impact of climate change on the sugar and rice industries with a view towards identifying the technological requirements for preserving these industries.

8.4.2.6 Forestry

Guyana's forest resource is already being sustainably used. However, there are actions, which can be taken to mitigate climate change and to adapt to the impacts of climate change. There is the need to examine the best means to promote climate mitigation technologies, including carbon sequestration in forest soils, and to determine, by way of collaboration with regional and international institutions, how to access, assess and obtain financial assistance for transfer of technologies.

8.4.2.7 Coastal Adaptation Technologies

Guyana's coast is low-lying and ninety percent of the population resides in the coast. The major agricultural crops are grown here and the commercial and industrial sectors are mostly located in the coastal belt.

8.4.2.8 Solid Waste Management and Waste Water Treatment

Methane is emitted from solid waste and wastewater through anaerobic decomposition and, together, they contribute about 20% of human-induced methane emissions. These emissions can be lowered by reducing waste generation (source reduction), diverting waste away from disposal sites (composting, recycling or incineration), recovering methane from waste and preventing waste decomposition in an anaerobic environment.

There is the need to identify the most effective mitigation activities and to accelerate the use of technologies, which are already in use in Guyana. Government will have to play a dominant role in technology transfer in this sector. The municipalities, the regional administrations and local communities will have to participate because the private sector may not see waste management as good business. However, appropriate policy and regulatory frameworks and incentives can motivate private sector involvement.

8.4.2.9 Human Health

Reducing the health impacts of climate change will require the reduction of exposure of local populations to climate change and its environmental and social consequences, reduction of the vulnerability of local populations to this exposure, and improved care and treatment for those whose health is adversely affected.

8.5 CONCLUSIONS

Guyana requires substantial financial and technical assistance in order to fully implement the Convention. The assistance ranges from capacity building and institutional strengthening to investment projects in the various sectors. Capacity building needs to be addressed at all levels of the socio-economic infrastructure: government (national and local), NGOs, private sector and community. Training will be necessary since the

human resource base is very limited. Capacity building should also address the networking of the groups and linkages with regional and international scientific, professional and private enterprise groups in order to foster access to and assessment of information related to technology transfer.

Investment projects are needed in all the sectors, which have been identified in this document. Feasibility studies and project finance sourcing (by developed Country Partners) will be prerequisites for attracting international assistance for these projects. The government is prepared to take actions to remove local barriers to investment in climate-friendly technologies and will facilitate private sector and investors meetings and other actions in order to promote direct involvement of the private sector in transfer of technology projects.