

Water: An important energy source?

At the «renewables 2004» conference in Bonn hydropower was again subject to many controversies with regard to the environment and water resources management. In their political declaration the 154 countries present at the conference considered hydropower as one important technology. In Africa hydro energy has a huge but yet untapped potential. Impacts on the environment can be mitigated if appropriate measures are being taken from the first beginning of a project.

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Photo: GTZ Uganda

The development of hydropower projects is essential for Uganda's energy policy.

Many countries in Africa are conscious of their responsibilities to increase access of the poor to modern energy services because they consider energy to be the engine of growth in a modern economy without which sustainable development cannot be realized. In Uganda only 9 percent of the population have access to electricity and only 3 percent of the rural countryside, where 90 percent of the people live, is electrified. The few rural based agro-industries are run on four times more expensive electricity derived from diesel engines.

Considering that energy demand is growing fast (see Box on page 55), these countries have realized that to attract and sustain private investment, good governance and appropriate conditions including sound, efficient and transparent fiscal, legal and regulatory frameworks are a prerequisite.

During the last International Conference for Renewable Energies in Bonn (June 2004), hydropower from large dams was again at the center of many controversies related to their environmental impact and to the management of water resources. The political declaration adopted by the 154 countries present in Bonn identifies hydropower as one of the renewable technologies «to be substantially increased with a sense of urgency». It recognized that hydropower, together with solar, wind, biomass and geothermal energy,

«can significantly contribute to sustainable development, to providing access to energy, especially to the poor, to mitigating greenhouse gas emissions, reducing harmful air pollutants, thereby creating new economic opportunities, and enhancing energy security through cooperation and collaboration». This means that the development of hydropower should benefit from the support given to other renewable energy sources as far as they are implemented on a sustainable way taking into account very seriously the implementation of the required mitigation measures.

In Africa hydro energy has a huge, but yet untapped potential, which could allow it



Photo: GTZ Uganda



Photo: GTZ Uganda

As part of the Rural Electrification Plan Uganda promotes small solar units for roof tops in the villages.

to make a significant sustainable contribution to future energy needs, offering a very good alternative to conventional sources of electricity. When developed countries have developed 70 percent of their hydro potential, Africa tapped only 4.3 percent of her hydro potential.

Water: an important energy source for developing countries

Considering the Millennium Development Goals, it is now very clear that these goals will not be achieved without increasing the supply of energy and without increasing the efficiency of the technologies consuming this energy. Looking now at the supply of energy and to the different sources still available in developing countries, it is also clear that alternatives to non-renewable energy sources like oil and gas must be identified and exploited. In Africa we are facing different problems linked to energy. On one side energy is necessary to cover the basic needs (e.g. cooking, lighting for households, health centers and schools) of the fast growing

population; on the other side, energy is required to reinforce the economic growth. This applies to the provision of energy for small, medium and large industries and also transport.

Africa is well endowed with large untapped hydropower resources. Hydropower can play its role at two levels: hydropower plants can provide electricity for the national network, for power export and for domestic and industrial use in urban areas. It offers also the possibility of decentralized production in rural areas from small- and mini-hydros which will be able to cover local demand for households, institutions and small and medium scale enterprises. In this case water can boost the local economic development of isolated populations by producing autonomous and reliable energy supply and it is suitable for co-operative or communal/district ownership. Combined with irrigation systems, it can be an appropriate solution in developing countries.

As a domestic resource not subject to market fluctuations, water is a flexible energy resource which can meet peak power demands for many African countries. Compared to other sources (oil, gas, coal), the life-cycle of hydropower produces limited amounts of greenhouse gases. Water can then play an important role in reducing air pollutants and CO₂ emissions and limit acid rains and global warming. Another interesting aspect of



In remote areas charcoal is still being used as main energy source.

hydropower plants is their long average life span. After more than 50 years, it is still possible at a reasonable cost to upgrade or extend a plant. This of course reduces the operating and maintenance costs on a long period.

The need for sustainable projects

The development of water resources for power generation must meet the needs of the people today without compromising the ability of future generations to meet their own needs. This is possible because hydropower is a technology benefiting from a long experience. The impacts on the environment are real but generally well known and can be mitigated if the appropriate measures are taken right

Energy and poverty*

- Over the next 20 years the growth in demand for energy will come mostly from developing countries.
- Over the past 20 years the world has managed to connect 40 million people yearly to electricity supply. At this rate of connection, in 20 years another 450 million people will join the 1.6 billion who today lack access to electricity.
- To meet the minimum needs of these 2 billion people, 100 million people would need to be connected each year for the next 20 years.
- We have to be aware that while today's energy-poor are largely in rural areas, by year 2020, 70 percent of the world population will be living in urban areas, and 60 percent will be below poverty, and many of those will be energy-poor.
- All this means that over the next 20-30 years developing countries will need to add hundreds of thousands of megawatts of new electrical capacity. Clearly, the investment needs for energy supply will be enormous. For instance estimates for new power generation capacity in developing countries will amount over US \$2 trillion over the next three decades.

*by Jamal Saghir (World Bank) during the World Summit on Sustainable Development in Johannesburg, August 2002.

from the beginning of the development of a project.

Water is now seen as one of the major areas of cooperation and integration in different regional structures like the East African Community (EAC) and the South African Development Community (SADC). These bodies have initiated very fruitful consultative processes to find a common position on their energy future and are looking very closely at the development of water resources including for energy purposes. This is a very good progress which

should be extended to many regions of the developing world to assure that such projects are developed and operated in an economically viable, environmentally sound and socially responsible manner.

Conclusion

The Government of Uganda is committed to create a conducive environment for sustainable and equitable growth and to meet the global challenge of delivering

sustainable energy services and reduce the energy poverty gap. Energy from water will play a big role in achieving this goal. To achieve this goal it is necessary that funding agencies provide funds on concessional terms for the development of hydropower projects. This would reduce the cost of these projects giving way to affordable tariffs. Without these projects there will be no poverty eradication, unemployment will remain a problem and there will be no upliftment of people's living standards.

The Ugandan Energy Sector

The Constitution of the Republic of Uganda, 1995, recognizes the need for an energy policy oriented to the poor when it states: «The State shall promote and implement energy policies that will ensure that people's basic needs and those of environmental preservation are met.»

The importance of energy for the poor and the development of Uganda is recognized in the Poverty Eradication Action Plan (PEAP). After an elaborated consultative process involving many stakeholders in Government, development partners, the private sector and the civil society, the Energy Policy for Uganda was approved by the Government of Uganda in September 2002. This policy is very much in agreement with the WSSD recommendations.

The Ministry of Energy and Mineral Development developed also different strategies and laws for the different sub-sectors which are very helpful to implement the policy. Arising from the laws, institutions have also been established to ensure efficient performance of the energy sector. To mention just a few:

- The Power Sector Reform and Privatisation Strategy, 1999
- The Electricity Act, 1999
- The Electricity Regulatory Authority established in 2001
- The Rural Electrification Strategy and Plan, 2001
- The Biomass Energy Demand Strategy, 2001
- The Rural Electrification Board and Agency established in 2002
- The Petroleum Supply Act, 2003

This institutional and legal framework supports the different ongoing and planned actions which with the support of the international community and national and international investors will allow Uganda to achieve the different policy goals. All these documents are available on the web page of the Ministry (www.energyandminerals.go.ug).



Photo: GTZ Uganda

Different programs and projects have also been initiated as part of these policies and strategies:

- The generation and distribution companies have been leased out to private operators on long term concessions; the Electricity Regulatory Authority supported by Norway is licensing Independent Power Producers to develop power generation projects in different regions of the country.
- An Energy for Rural Transformation (ERT) programme supported by World Bank, GEF and other donors have been launched;
- The Energy Advisory Project (EAP) supported by the German Government and already very much involved in the policy work has initiated a new biomass, energy efficiency and renewable energy component;
- Electrification Programmes are also supported by the Swedish agency SIDA and the African Development Bank;
- A partnership between DFCU (Development Finance Cooperation Uganda) Leasing and the Shell Foundation has been established to lease energy equipment to small and medium enterprises.