Nile Basin Initiative
Shared Vision
Program

NILE BASIN REGIONAL POWER TRADE

PROJECT DOCUMENT

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Council of Ministers of Water Affairs
of the Nile Basin States

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ABBREVIATIONS AND ACRONYMS

AC	alternating current
CEO(s)	chief executive officer(s)
CIDA	Canadian International Development Agency
DC	direct current
DRC	Democratic Republic of Congo
DSS	decision support system
GEF	Global Environmental Facility
IMS	information management system
EAC	East African Community
EEA	Egyptian Electricity Authority
EELPA	Ethopian Electric Light and Power Authority
EEPCo	Ethopian Electric Power Company
ELECTROGAZ	Public Utility for Production, Transport and distribution of Electricity, Water, and Gas (Rwanda)
ENR	Eastern Nile Region
ENSAP	Eastern Nile Subsidiary Action Programs
GW	Gigawatt
ICCON	International Consortium for Cooperation on the Nile
IGMOU	intergovernmental memorandum of understanding
IPPs	independent power producers
ITC	interim technical committee
ITOs	independent transmission operators
IUMOU	interutility memorandum of understanding
KPC	Kenya Power Company
KPLC	Kenya Power and Lighting Company
Market	regional power market
MW	megawatt
NBI	Nile Basin Initiative
NELR	Nile Equatorial Lakes Region
NELSAP	Nile Equatorial Lakes Region Subsidiary Action Programs
Nile-COM	Council of Ministers of Water Affairs of the Nile Basin States
Nile-SEC	Secretariat
Nile-TAC	Technical Advisory Committee
PTWG	power trade working group
PMU	project management unit
Power Forum	Nile Basin Power Forum
REGIDESO	Régie de Production et de Distribution d'Eau et Electricité (Burundi)
SAP	Subsidiary Action Programs
SAPP	Southern African Power Pool
SEA	strategic environmental and social assessments
SINELAC	Société Internationale d'Electricité des Pays des Grand Lacs
SNEL	Société Nationale d'Electricité du Congo (DRC)
SVP	Shared Vision Program
TANESCO	Tanzania Electric Supply Company, Ltd.
TWh	terrawatt hour
UEB	Uganda Electricity Board
UNDP	United Nations Development Programme
Water Resources Project	SVP Water Resources Planning and Management Project

Please note that all dollar figures are current U.S. dollars unless indicated otherwise

PREFACE

In an historic effort, the ten countries of the Nile have come together within the Nile Basin Initiative to realize a shared vision *'to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources.'* Recognizing the tremendous benefits that can be reaped from cooperation, yet fully aware of the challenges ahead, the Nile countries have embarked on a remarkable journey to translate their shared vision into concrete activities and projects that will build confidence and capacity across the basin (the *Shared Vision Program),* as well as initiate concrete investments and action on the ground at local levels (*Subsidiary Action Programs).*

Presented herein is one of the projects within the Shared Vision Program. The full project portfolio includes:

- Nile Transboundary Environmental Action
- Nile Basin Regional Power Trade
- Efficient Water Use for Agricultural Production
- Water Resources Planning and Management
- Confidence-Building and Stakeholder Involvement (Communications)
- Applied Training
- Socio-Economic Development and Benefit-Sharing

As a whole, the Shared Vision Program aims to create an enabling environment for cooperative development and management. Though each project is different in focus and scope, all contribute to building a strong foundation for regional cooperation by supporting basin-wide engagement and dialogue, developing common strategic and analytical frameworks, building practical tools and demonstrations, and strengthening human and institutional capacity.

The seven projects of the Shared Vision Program build upon each other to form a coordinated program. They address the major water-related sectors and cross-cutting themes deemed critical by the Nile riparians to ensure an integrated and comprehensive approach to water resources development and management, and that this development serves as a catalyst for broader socio-economic development and regional cooperation. Together, the projects of the Shared Vision Program seek to forge a common vision for – as well as build the capacity to achieve - the sustainable development the River Nile for the benefit of all. They pave the way for the realization of investments on the ground through the Subsidiary Action Programs.

The detailed preparation of the Shared Vision Program was accomplished through a unique, multi-country, multi-sectoral and highly participatory process led by the Nile Council of Ministers and Technical Advisory Committee and executed by the Nile Secretariat. More than 70 national experts, including 8 technical specialists from nine countries, were involved in detailed project preparation. For many, it was the first time that they were able to discuss common concerns with their colleagues from neighboring and co-riparian countries. The energy and hope for the future engendered by this preparation process were a visible demonstration of the power of cooperation, strong riparian ownership, and the commitment of the Nile countries to jointly pursue their common goal.

But the preparation of the Shared Vision Program is just a beginning. Implementing these projects and ensuring that tangible benefits are realized is the next challenge. It is a challenge which requires deepening partnerships with the international development community. Promoting cooperation among the countries of the Nile will inherently be a complex process. However, such cooperation is essential if sustainable development and management of the Nile is to be achieved.

1. SUMMARY

This proposal for a Nile Basin Regional Power Trade Project has been developed under the Shared Vision Program (SVP) of the Nile Basin Initiative (NBI). The project aims to establish the institutional means to coordinate the development of regional power markets among the Nile Basin countries and build analytical capacity and provide technical infrastructure to manage Nile Basin resources in keeping with the vision articulated by the Nile riparians "to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the common Nile Basin water resources."

The institutional arrangement will foster an enabling environment conducive to increasing power trade in the Nile Basin. The associated infrastructure will further Nile cooperation by enhancing mutual confidence and providing a critical building block to managing Nile water resources from a regional perspective.

The project has two main components:

- The establishment of a power forum to support continued discourse and promote power trade among Nile Basin countries

- Comprehensive basin-wide analysis of long-term power supply, demand, and trade opportunities in order to inform the planning of multi-purpose river basin management in the Subsidiary Action Programs (SAPs)[1] of the NBI.

Both the components are primarily of a capacity-building and knowledge-sharing nature and will be strengthened within the context of an institution referred to as the Nile Basin Power Forum. The project components, therefore, are expected to not only enhance individual and institutional capacity to manage and develop basin-wide hydropower resources, but also to derive large but immeasurable benefits in building intra-riparian cooperation through coordinated power system operations. Furthermore, by developing and incorporating a common culture of good practices through the collaborative development of hydropower and transmission interconnection projects, the Nile Basin riparians seek to formalize and cement the participatory process for sharing the mutual benefits that will result from regional power trade. The estimated cost of the two components of this project, over a period of three years, is about $12 million.

This project was developed by the Nile Basin Power Trade Working Group (PTWG) through a collaborative, multi-country participatory process. National power experts from each of the Nile Basin countries worked with members of the Technical Advisory Committee of the Initiative (Nile-TAC) in the preparation of the project document. This project document reflects riparian perspective on national and regional needs, project components which are deemed to be implementable and confer real benefits, and a project design based on lessons learned from other international regional power trading development arrangements. The participatory project preparation process demonstrates riparian ownership and commitment to successful project implementation.

2. PROJECT DEVELOPMENT OBJECTIVES

2.1. Long-term Goal and Development Objective

Long-term Goal. The long-term goal of this project is to improve access to reliable and low-cost power in the Nile Basin in an environmentally sustainable manner. An important element in achieving

[1] Within the overall framework of the NBI, the SAP will comprise investment projects which provide mutual benefits to two or more countries. The Nile riparians have formed two major sub-regional groupings: The Eastern Nile (EN-SAP) including Egypt, Ethiopia and Sudan; and the Nile Equatorial Lakes Region (NEL-SAP), including Burundi, DR Congo, Egypt, Kenya, Rwanda, Sudan, Tanzania, and Uganda.

this goal is to create an effective institutional mechanism to promote and develop power trade opportunities among the countries participating in the NBI. The creation of a regional electricity market can play a key role in furthering cooperation among the Nile Basin states and in ensuring that the hydropower resources of the Nile Basin are developed and managed in an integrated and sustainable manner.

Development Objective. The specific development objective of this project is to establish the institutional means to coordinate the development of regional power markets among the Nile Basin countries. This project will focus on the preparatory activities related to the establishment of such an institution, referred to as the Power Forum. The countries participating in the NBI understand the importance of interconnecting their electric power systems for the development of a regional power market. The establishment of the market is expected to have positive effects on systems reliability and economies of scale in planning, construction, and operation of the generation and transmission facilities in the region. Furthermore, the market is expected to make a significant contribution to the competitiveness of the Nile Basin economies by directly, and indirectly, creating new jobs and economic opportunities, and will thus provide a significant impetus towards achieving the regional aims of economic growth, prosperity, and stability in the Nile Basin region.

2.2. Key Performance Indicators

High-level performance indicators are:

- Effective dialogue and cooperation among Nile Basin power utilities are established
- Strategic framework for advancing power trade in the region is developed
- Common understanding of the institutional and regulatory frameworks required to support power trade is enhanced
- Investment needs to facilitate power trade are identified.

2.3. Project Links to Poverty Reduction, Gender Issues, and Regional Integration

Energy Essential to Societal Endeavor*.* No modern society has developed without access to modern, clean, and affordable energy services such as electricity. However, today over 500 million people in sub-Saharan Africa (about 85%), do not have access to modern energy services. In the case of electricity, the population is growing at a faster pace than the ability of most state-owned electric power utilities to provide connections and meet demand.

Poor do not Live Lives in Individual Sectors. Just like no one sector can be singly instrumental in addressing the poverty alleviation challenge, no single SVP project can singly reduce poverty. Yet the poverty reduction strategy acquires added value and momentum when it is buttressed by investments in regional energy projects as well as other sectors such as health, education, and transport that guarantee the integration of disenfranchised communities in a growing economy and developing society.

Regional Energy Integration: Key Role in Poverty Reduction. The income growth potential that energy services bring to the poor is considerable. It empowers them to take better advantage of the social services that are offered. Affordable and efficient energy enables communities to light their homes and schools, refrigerate their supplies, power their telephones and TVs, avoid polluting fuels, and support productive businesses. Electricity is essential for electronic communications and together with roads connect people and their businesses to national and regional markets and beyond, and open up new job and education opportunities. In energizing productive uses, regional energy integration fuels the economic engine for value creation, growth, and connecting goods to markets.

Gender Dimension of Energy**.** Women disproportionately bear the negative impacts of inadequate modern energy access and poor reliability. For example, cooking is women's most important energy need in terms of time and effort. Biomass is the primary fuel used for cooking by poor households. Women (and also children) expend the most effort in collecting these biomass fuels and using them.

The negative health effects of biomass use on poor women and children are well established. Also, women's micro-enterprises (an important factor in household income as well as in women's welfare and empowerment) tend to be either heat-intensive (food processing) or light-intensive (sewing and crafts with potential for extended evening work hours). Lack of adequate electricity supplies affects women's ability to operate these micro-enterprises profitably and safely.

2.4. Project's Contribution to Regional Economic Development

In the Nile Basin, expanding the provision of electricity to productive purposes and income generation business opportunities will catalyze regional economic development. One way to increase access to electricity is through the cooperative development of hydropower and transmission interconnection investment projects. For such projects to be effective, improved regional power planning and coordinated power system operation and management are needed across the Basin. Based on reliable information and aided by planning and analytical tools, a coordinated effort will enable the identification and evaluation of regional power projects, and implementation of such projects will confer mutual benefits to the participating trading countries.

The Power Forum provides the institutional mechanism for informed decisionmaking and provides an essential input to the wider process of integration across sectors, such as power, environment, and water resources management, and to the sharing of the benefits from "win-win" development projects. The SVP Regional Power Trade Project is thus expected to benefit other SVP projects, as well as to help identify Subsidiary Action Projects that will support sustainable regional economic growth and improved social conditions, in the long term benefiting the people of the Nile Basin.

2.5. Project's Impacts on Poverty and Gender Issues

Access to reliable electricity services will directly enhance the income, capability, and security of the poor by:

- Reducing the time and effort spent gathering biomass fuels to cook daily meals
- Boosting labor productivity through irrigation, crop processing, and mechanization
- Improving illumination that directly impacts educational attainment and income producing activity (crafts, small businesses)
- Reducing health risks through the use of cleaner burning fuels
- Improving access to information (through radio, television, and telecommunication)
- Increasing sense of security through reliable access to fuels for daily living and expanded fuel choice.

3. STRATEGIC CONTEXT

3.1. The Nile Basin Initiative (NBI)

***The Nile Basin*.** The Nile River, the longest river in the world, traverses more than 6,700 kilometers from its farthest point at the headwaters of the Kagera River in Rwanda to its delta in Egypt on the Mediterranean Sea. Ten countries share the Nile: Burundi, Democratic Republic of Congo (DRC), Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda. The Nile River Basin covers 3 million km^2—one tenth of Africa's total land mass. It serves as home to world-class environmental assets, such as Lake Victoria (the second largest fresh water body by area in the world) and the vast wetlands of the Sudd. It also serves as home to an estimated 160 million people within the boundaries of the Basin; while nearly twice that number—roughly 300 million—live within the ten countries that share the Nile waters.

Challenges and Opportunities. Despite the extraordinary natural endowments and rich cultural history of the Nile Basin, its people face considerable challenges. Today, the Basin is characterized by poverty, instability, rapid population growth, and environmental degradation. Half the Nile riparian countries are among the world's ten poorest. Population is expected to double within the next 25 years, placing additional strain on the scarce water and other natural resources. Yet the Nile holds

significant opportunities for win-win development that could enhance energy availability, food production, transportation, industrial development, environmental conservation, and other related development activities in the region. Cooperative water resources management might also serve as a catalyst for greater regional integration, both economic and political, with benefits far exceeding those derived from the river itself.

Towards a Long-Term Legal and Institutional Framework. Aware that forward movement on Nile cooperation requires a development focus, a permanent institution, and agreement on core legal principles, the Nile riparians established a forum to facilitate a process of legal and institutional dialogue in 1997. In early 2000 a panel of experts, including senior government lawyers and water resources specialists from each country, produced a draft text of a "Cooperative Framework." This draft Framework has moved the riparians a long way and important compromises have been reach. However, some key issues remain to be resolved, and the Council of Ministers agreed in August 2000 to extend the process to further dialogue on outstanding issues. The United Nations Development Programme (UNDP) has pledged its continued support to the process—a process which by its very nature requires time and effort.

The Nile Basin Initiative. Recognizing the need to take concrete steps to realize the development potential of the Nile while the dialogue on a permanent legal and institutional framework continues, the Nile riparians took an historic step towards cooperation in the establishment of the Nile Basin Initiative (NBI). Formally launched in February 1999, the NBI is a transitional institutional mechanism that includes all riparians and provides an agreed basin-wide framework to fight poverty and promote economic development in the region. The Initiative is guided by a shared vision "to achieve the sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources"[2] and a set of policy guidelines which provide a basin-wide framework for cooperative action. The NBI is comprised of a Council of Ministers of Water Affairs of the Nile Basin (Nile-COM), a Technical Advisory Committee (Nile-TAC), and a Secretariat (Nile-SEC) located in Entebbe, Uganda.

A Strategic Action Program. To translate the NBI's shared vision into action, a strategic action program has been launched to identify and prepare cooperative projects in the Basin. The Program consists of two complementary sub-programs, a SVP of technical assistance and capacity-building-type projects to be implemented basin-wide to create an enabling environment for cooperative development and SAPs carried out by smaller groups of Nile riparians, comprising physical investments at the sub-basin level.

The basin-wide Shared Vision Program currently includes seven projects. Four of these are thematic in nature, addressing issues related to environmental management, power trade, efficient water use for agriculture, and water resources planning and management. The remaining three are facilitative, supporting efforts to strengthen confidence-building and stakeholder involvement, applied training, and socio-economic development and benefit-sharing.

Two Subsidiary Action Programs have formed. The Eastern Nile (EN-SAP) currently includes Egypt, Sudan and Ethiopia, while the Nile Equatorial Lakes Region (NEL-SAP) includes the six countries in the southern portion of the Basin, as well as the downstream riparians Sudan and Egypt. These subsidiary groups have identified joint investment projects which warrant further investigation and preparation.

Riparian Consultative Process. The Nile-COM is the main policy and guidance forum for Nile Basin cooperation. Important roles of the Nile-TAC are to coordinate joint activities and establish working groups as needed to accomplish specific tasks. The Nile-TAC is responsible to the Nile-COM for the preparation of the Shared Vision Program, which will be coordinated and implemented at the basin-wide level. While the Nile-TAC is to promote the establishment of working groups of concerned

[2] Council of Ministers of Water Affairs of the Nile Basin States*, Policy Guidelines for the Nile River Basin Strategic Action Program*, February 1999.

countries to identify Subsidiary Action Program projects at the sub-basin level, the responsibility for Subsidiary Action Programs will rest with the involved riparians. Throughout the process, high priority will continue to be placed on strengthening the process of consultation in order to build trust and confidence. Figure 1 below illustrates how country activities will take place within sub-basin frameworks, which will occur within the broader context of the basin-wide framework. The basin-wide framework also includes an "international discourse" to promote international support for the sustainable development and management of Nile waters.

International Consortium for Cooperation on the Nile (ICCON). An International Consortium for Cooperation on the Nile (ICCON) is being established to support the NBI's Strategic Action Program. Its first meeting is scheduled for June 2001. The ICCON will be a unique forum, organized by the World Bank at the riparians' request, and envisioned as a long-term partnership of the riparian states and the international community. The first meeting of the ICCON will seek to raise funding for a portfolio of basin-wide Shared Vision Projects and the preparation of projects identified under the Subsidiary Action Programs. The first ICCON meeting will also celebrate cooperation and demonstrate international solidarity for cooperative development in the Nile Basin.

Partnerships. Support for the Nile Basin Initiative has been characterized by partnership since it began. The initial partners comprised the World Bank, the United National Development Programme (UNDP), and the Canadian International Development Agency (CIDA). These initial 'cooperating partners' played the role of concerned facilitators, assisting the process of dialogue. As the NBI moved into the preparation of the Strategic Action Program, the governments of Denmark, Finland, Germany, Italy, the Netherlands, Norway, Sweden, the United Kingdom, and the United States, together with the Food and Agriculture Organization (FAO) and the Global Environmental Facility (GEF), actively supported the Initiative, directly or through World Bank trust funds. With the first ICCON, the circle of partners will widen as the international development community commits further support for Shared Vision Projects and for preparation of Subsidiary Action Projects.

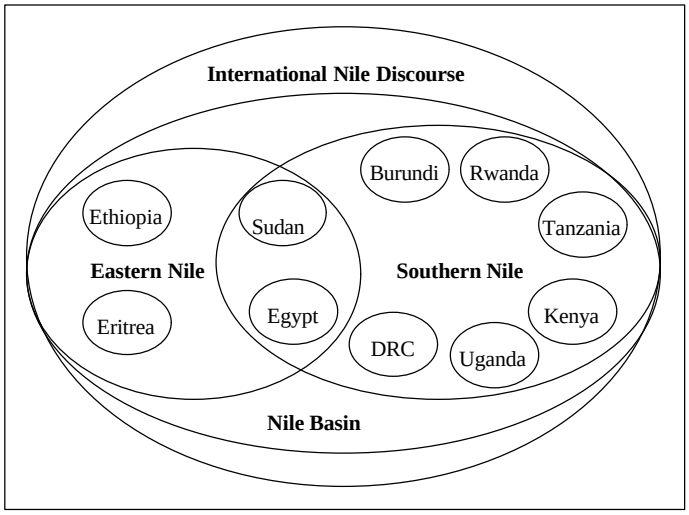

Figure 1. An Illustration of Possible Levels of Nile Cooperation

Summary. The NBI provides a transitional institutional mechanism, an agreed vision and basin-wide framework, and a process to facilitate substantial investment in the Nile Basin to realize regional socio-economic development. The NBI represents deep commitment by the Nile riparian countries to foster cooperation and sustainable development of the River Nile for the benefit of all.

3.2. NBI Guidelines and Project Goals

The policy guidelines[3] adopted by Nile-COM in February 1999 define the primary objectives of the NBI as follows:

- To develop the water resources of the Nile Basin in a sustainable and equitable way to ensure prosperity, security, and peace for all its peoples
- To ensure efficient water management and the optimal use of the resources
- To ensure cooperation and joint action between the riparian countries, seeking win-win gains
- To target poverty eradication and promote economic integration
- To ensure that the program results in a move from planning to action.

Adequate and reliable power supply is critical to meeting the social and economic development objectives of the Nile Basin countries. Yet, in a large majority of the Nile Basin countries, only around 10% of the population has access to electricity. This situation exists despite the presence of vast and as yet untapped hydroelectric and other energy resources in the Nile Basin. The present limited development of national power systems in the Basin imposes a constraint on the exploitation of these resources at affordable costs at the national level. The cost of hydropower in the Nile Basin is also increased by the large seasonal variations in hydropower output, whilst the costs of meeting peak loads on national power systems can be high in countries where these loads are supplied from expensive thermal plants. These constraints on supplying affordable power could be overcome by expanding the market for these resources by developing power trade among Nile Basin countries.

Countries in the Nile Basin are aware of the potential benefits from trading power. Therefore, while current levels of power trade among Basin countries are low, many of them are considering ways to increase the levels of this trade and are looking for suitable investments to realise this objective. A recently prepared scoping study[4] —*Opportunities for Power Trade in the Nile Basin*— that was reviewed and revised by the PTWG of the SVP identifies several options for increasing power trade in the region. In the short term, many of these opportunities exist at the sub-regional level. It also appears that it is important to evaluate power trade opportunities in the context of a broader multipurpose approach to Nile Basin water resources development and management.

The scoping study further found that a more focused and coordinated process for discussing ways to expand power trade in the Nile Basin would advance the development of power supply facilities. The study recommended that this objective be realised through the creation of a basin-wide “forum” of national power experts to facilitate continued dialogue in the region. Power forums are proving effective in developing power trade among other regional groups of countries, notably in the Southern African Power Pool (SAPP), the Mekong Regional Power Market, and the Central American Regional Electricity Market in the Mercosur region. The establishment of regional power markets have generally improved systems reliability and economies of scale in planning, construction, and operation of the generation and transmission facilities, thereby contributing to the development and integration of regional economies.

To recognizie the potential benefits of power trade, it is proposed that a Power Forum be established within the context of the NBI to support; (a) formation of an institutional infrastructure for Market development, (b) a learning environment for understanding the nuances of legal, regulatory, and pricing regime required for regional power trade, and (c) identification of power generation and transmission projects that will benefit power trade among the Nile Basin countries.

[3] *Policy Guidelines for the Nile River Basin Strategic Action Program*, Council of Ministers of Water Affairs of the Nile Basin States, February 1999.
[4] *Opportunities for Power Trade in the Nile Basin - Final Scoping Study*, Norconsult/Statnett, September 2000.

3.3. Power Sector Context

Characteristics and Features of the National Power Systems

The region's current electricity requirements are 18GW and are forecast to grow to 30GW in 2005, 39GW in 2010, and 65GW in 2020. Consumption in the Basin is dominated by Egypt which accounts for more than 80% of the demand.

The forecasted electricity requirements translate to a need for about 12,000 MW of new capacity to be installed every five years—-a formidable task. Although many potential hydropower sites exist, major load centers are far apart and located at considerable distance from the sources of supply.

Existing or Contemplated Cross-Border Electricity Trade

At present there is very limited cross border electricity trading between the countries of the Basin. In those cases where network extensions have been made to accommodate trading, such extensions have usually been on the extremities of the power network—often aimed at supplying a remote load or providing grid power to an isolated network in a neighboring country. The Nile Basin can be considered in two sub-regions, i.e., the Eastern Nile Region (ENR) and the Nile Equatorial Lakes Region (NELR). The former consists of Egypt, Ethiopia, Eritrea, and Sudan while the latter includes the eastern part of the DRC, Burundi, Rwanda, Tanzania, Uganda, and Kenya. At present there is no international power trade in the ENR, and there are also no interconnections in place between the ENR countries. In the NELR there is some (bilateral) trade of power at a rather modest level (about 174 GWh in 1999).

The power system in Uganda is interconnected with that in Kenya, Rwanda, and Tanzania. Uganda has been exporting power to Kenya since 1958 when the Owen Falls Power Station and the Tororo-Nairobi 132 kV transmission line was completed and commissioned. This power export is under the Kenya-Uganda Electricity Agreement, signed in 1955, according to which Uganda Electricity Board (UEB) is supposed to supply 30 MW of electrical power to Kenya Power Company (KPC) for fifty years.[5] The average power export from Uganda to Kenya, Tanzania, and Rwanda during the period 1997–1999 was 167 GWh per year.

In 1993, UEB entered into an agreement with Tanzania Electric Supply Company, Ltd. (TANESCO) that is called the "UEB-TANESCO Electricity Agreement, 1993." Under this Agreement, UEB shall supply 9 MW of electrical power to the Bukoba region of Northern Tanzania for 30 years. Power is also imported from Nakonde in Zambia through a 33 kV line to supply Tunduma, Mobozi, and Ileje in Tanzania. Tanzania plans to upgrade its interconnection with Zambia to 330 kV, giving it access to the SAPP.

An agreement between UEB and Electrogaz of Rwanda was entered into in 1995. Under this agreement, UEB shall supply 5 MW of electrical power to Rwanda, delivered at the Rwanda-Uganda border.

DRC, Rwanda, and Burundi have jointly developed two hydropower plants located in DRC. These are the Ruzizi I and Ruzizi II power plants that have a total aggregate installed capacity of 55 MW and a mean annual production of about 289 GWh, comprised of 148 GWh from Ruzizi I and 141 GWh from Ruzizi II. The Ruzizi I power plant is operated by SNEL (Société Nationale d'Electricité du Congo), the power company in DRC. According to an agreement with DRC, Rwanda is at present able to import 3.5 MW from this power plant. Burundi imports power from Ruzizi I based on payment of SNEL's debts to Burundi with a background in the joint financing of the power plant. The remaining credit at the end of 1999 was about 180 GWh. The Ruzizi II power plant is jointly operated and the countries are each entitled to one third of the production. Rwanda also exports power to the Kisoro

[5] Four supplemental agreements to this one have since been signed to determine the tariff at different times. This export has, however, been below the agreed level for long periods due to capacity constraints in the power system in Uganda.

border region in Uganda. Egypt is interconnected to multiple regions outside the Nile Basin such as Libya and the Mahgreb, Jordan, and the Eastern Mediterranean.[6]

In the future, cross border connections could be expanded for remote limited power applications, but could also include high voltage large power interconnections justified for the import of power as a cheaper alternative to local power generation or for the purpose of wheeling power across the country to a neighboring country. Potential examples of such developments include stronger interconnections between Uganda, Kenya, and Tanzania., transmission interconnections between Ethiopia and Sudan and Ethiopia and Eritrea, and possible DC interconnections between Egypt and Ethiopia and/or Sudan. Ethiopia could also be linked to Kenya and Uganda, while Tanzania could be more firmly linked to the existing DRC east/Burundi/Rwanda system.

Generation Potential

Excluding the DRC (with its huge generation potential on the Congo River), the power generation potential of the Nile Basin countries for the next 50 years is probably in the order of 550 TWh per year. This is compared to the present level generation of about 80 TWh. The region is endowed with both thermal and hydro resources for the production of electricity. Countries such as Uganda, Tanzania, and Ethiopia have considerable hydropower resources that are well above the domestic needs of these countries, even in a long-term perspective. Other major resources are found in Egypt, Eritrea, Ethiopia, and Sudan in the form of hydrocarbons, particularly natural gas that can be used for large scale power generation. Other countries have complementary resources, mainly in terms of hydropower, but also a potential for geothermal energy—particularly in Ethiopia and Kenya.

In all Basin countries except Egypt, development of the power system is limited, as is access to electricity. However, there are good untapped sources for power generation, coupled with a desire to improve access to electricity for both domestic and industrial/commercial consumers to improve the quality of life and increase economic growth. Because domestic markets are small (except for Egypt), an important mechanism to realize benefits from these resources in the near-to-medium term is to sell power to neighboring markets. The prevailing policy regarding sector development is to maintain a high level of national self-sufficiency as a first priority, and to investigate scope for power trade with neighboring systems as a secondary priority.

The area covered by the Nile Basin is enormous so that a future interconnected transmission network from Dodoma in Tanzania would reach 5,000 kilometers north to Cairo in Egypt with a breadth between Sudan and Eritrea of 2,000 kilometers. Within this area is a multitude of land surfaces from mountains to plains and forest to desert. The nature of such a variety of geographical characteristics will have considerable influence on the siting of future generation and the routing and design of transmission lines.

One advantage of developing a framework and mechanism for regional electricity trade is that site selection is not necessarily limited to meeting the power generation needs of an individual country. Sites previously not considered economically viable, as they would entail production in excess of national requirements, could be reconsidered with the plant being sized to realize the benefits of economies of scale. Such optimal site selection would then, of necessity, need to address cross border transmission strengthening to dispatch the generation throughout the region.

Nile Basin Power Cooperation and Electricity Market Reform

The existing Nile Basin national power utilities are traditional vertically integrated utilities. This facilitates dialogue between utility management and government in discussing electricity sector

[6] The 220 kV interconnection between Egypt and Libya commenced operation in December 1998. The Egypt-Jordan interconnection (500 kV and 400 kV through the Sinai and Aqaba Gulf) was commissioned in September 1998. The Eastern Mediterranean Interconnection is planned to link with, and supply power to, the European grid.

developments. However, most of the state-owned power companies require improvements in their commercial and financial operations, not only to support power trade but also to improve reliability and accessibility of supply. The countries of the region are addressing these issues under ongoing reform programs, and several of the utilities are presently being exposed to unprecedented change as a consequence of decisions around power sector reform. The governance nature and structure of each country's power sector needs to be well understood in developing frameworks aimed at promoting and enhancing regional electricity trade.

The restructuring and unbundling of state-owned vertically-integrated national power utilities is already underway in most of the Basin countries. Reform is generally driven by a need to mobilize capital for new investments from private and international sources, encourage more cost-reflective tariffs and prices, and introduce competition in generation and supply (for example through introduction of independent power producers—IPPs). This also introduces the need for independent regulation of the electricity supply industry. Uneven regulatory reforms in the region may create greater differences in sector governance between countries, but need not inhibit the introduction of regional electricity trading.

Table 1. Status of Power Sector Reform in the Nile Basin Countries[7]

STATUS OF POWER SECTOR REFORM IN NILE BASIN COUNTRIES					
Country	**Maturity of Reform Process**	**Regulator Established**	**IPPs Permitted**	**Transmission Access**	**Market Characteristic**
Burundi	The text of the laws ruling the power and drinking water sector is to be studied by Parliament in April 2000. The government has already expressed its willingness to open the power sector to privatization	Not yet.	Yes, very soon, after passing of the laws	Not yet	Power is still exclusively sold by REGIDESO and DGHER These institutions distribute power right to the consumer's home
DRC	There is still no institutional reform. Production, transmission, distribution, and sales of energy is handled by the state owned company SNEL				
Egypt	In progress since 1984 several laws of deregulation introduced	Under consideration (1997)	Yes (1996)		The power sector operates like a vertically integrated state company, but unbundling is in progress both in generation and distribution
Eritrea	Only policy statements of will to deregulate				Corporatization and privatization of the Department of Energy being discussed
Ethiopia	In progress since 1997, and proclamation, and regulation has been issued Directives are under preparation	Yes, operational since October 1998	Yes	Yes, by proclamation	The state power utility EELPA has been corporatized and called EEPCo. Foreign and local private investors are allowed to invest in hydropower generation without capacity limit
Kenya	The reform process in Kenya is now completed. The final step was the transfer of all public sector owned power generating assets to KenGen and all the transmission and distribution assets to KPLC.	The Electricity Regulatory Board was established through the Electric Power Act 1997 and started operating in 1998	Operation of IPPs commenced with two PPAs signed in 1996. Two IPP plants started operating in 1997. Two more PPAs have since been signed	There is no access as yet, although the governing legislation mentions that contracts for the transmission network services are to be approved by the regulator	Previous monopolies in the public sector have been reorganised into generation, transmission, and distribution companies. Two IPP plants have been in operation since 1997, two PPAs were signed in 1998 and another PPA is currently being negotiated
Rwanda	Preparation of information required to support the process for the selection of private sector operators for the sectors Assistance during the negotiations and signing of the agreements The preliminary report is available				

[7] *Chapter 4—Framework for Developing Power Trade*, *Opportunities for Power Trade in the Nile Basin - Final Scoping Study*, Norconsult/Statnett, September 2000

Table 1. Status of Power Sector Reform in the Nile Basin Countries (cont'd.)

STATUS OF POWER SECTOR REFORM IN NILE BASIN COUNTRIES					
Country	**Maturity of Reform Process**	**Regulator Established**	**IPPs Permitted**	**Transmission Access**	**Market Characteristic**
Sudan	Reform under process since late 1998. The "Electricity Act" has been prepared for government approval	No, awaiting "Electricity Act" approval	Yes, since 1996	No	The Power Sector still operated as State Corporation with unbundling in distribution, which is in progress. IPPs in generation are developing, even before the legal frame is approved
Tanzania	*The government has already made a decision to restructure power sector to allow for private participation*	Legal and Regulatory Framework is in process	Yes	Open access under an independent Transmission Systems Operator is expected.	A move toward more competitive markets in the electricity sector is in its infancy with some competition established in generation.
Uganda	A new Electricity law was enacted in November 1999	Yes	Yes	Yes	Ring fenced business unit within the transmission company will be responsible for bulk purchase and supply of electric power. In the long term, distribution companies and large consumers will contract generation capacity directly with generators. Introduction of limited retail competition will be in the mid-term

In addition, three regional institutions have mandates for power trade. SINELAC (Société Internationale d'Electricité des Pays des Grand Lacs) is associated with power trade in the Great Lakes region and in particular the tri-national Ruzizi project. CEPGL and the east African community are regional economic organizations whose charters include cooperation in energy and electricity.

Sector regulations are currently being drafted with only national markets in mind. Most of the Basin countries permit IPPs, but, as yet, only a few are operating. However, as countries have been restructuring their power sectors and revising their investment laws, several IPPs are at advanced stages of development. For example, financing for the SDI Krill in Egypt has closed, Bujagali in Uganda, and Songo-Songo in Tanzania are in the final stages of financial closure. However, harmonization of regulatory practices should be given attention to further stimulate regional trade, particularly regarding access to transmission networks and transmission pricing issues, including the wheeling of power over third party networks.

4. PROJECT DESCRIPTION

The NBI Shared Vision Program Regional Power Trade Project has two components:

- Establishment of the Power Forum
- Comprehensive basin-wide analysis of long-term power supply, demand, and trading opportunities.

The description of each of the project components is given below and the logical framework ("logframe") is presented in Annex A.

4.1. Component 1: Nile Basin Power Forum

This component will establish an institutional forum to promote and support power trade amongst the Nile Basin countries. This forum will foster an enabling environment conducive to increasing power trade in the Nile Basin. The Power Forum will create a culture of implementing best practices, practical analytical tools, and enhanced regional power operational planning and coordination skills. The Power Forum will also coordinate their analytical activities with the Water Resources Management component for understanding river system behavior, assessing impacts of multi-purpose hydroelectric power projects, developing and evaluating operational schemes for coordinated river system management, and supporting informed decisionmaking from a regional perspective. The preliminary contours of the Power Forum, as set forth by the Nile Basin PTWG, are described below.

Objectives of the Power Forum

The overall objective of the Power Forum is the creation and support of a regional power market through:

- Building necessary institutional and human capacity and establishing the necessary information support systems and tools
- Facilitating the creation of the institutional and physical infrastructure for power trade
- Assisting in the development of power markets
- Identifying projects to be considered for implementation at the subsidiary level.

Functions of the Power Forum

The primary functions of the Power Forum, particularly during its formative period, will be to:

- Facilitate dialogue and cooperation among power utilities in the region, including (a) collecting and exchanging information and experience, (b) preparing a consistent framework for power data reporting for the Nile Basin countries, (c) increasing awareness through web-based newsletters, (d) scheduling and supporting management and technical meetings, and (e) reviewing and analyzing issues of common interest.

- Commissioning special studies, including but not limited to (a) identification of investment projects related to production and transmission systems in order to facilitate power trade, and (b) development of institutional and regulatory frameworks to support regional power trade.

- Coordinate the analytical activities with the Water Resources Project, such as (a) understanding river system behavior, (b) assessing impacts of multi-purpose hydroelectric power projects, (c) developing and evaluating operational schemes for coordinated river system management, and (d) supporting informed decisionmaking from a regional perspective.

- Assisting in developing the strategic framework and agreements for advancing power trade in the region

- Preparing a consistent framework for power demand forecasting for the Nile Basin countries

- Facilitating training programs in all facets of power sector operations

- Mobilizing resources for carrying out these functions.

Additional functions of the Forum may develop as power trade matures, including developing consistent rules and standards for power market operations.

Institutional and Management Framework

The NBI transitional institutional structure, comprised of the Nile-COM and Nile-TAC and supported by the Nile-SEC, will provide overall policy guidance to the project.

It is proposed to commence the establishment of the Power Forum during its formative phase through a simple institutional arrangement followed by more permanent structures.

4.1.1. Organizational Structure: Formative Phase (March 2001–February 2003)

It is proposed, that during the formative phase of the Power Forum, the Nile-TAC, in consultation with appropriate officials in the ministries responsible for electricity, authorize the current NBI PTWG to form an interim technical committee (ITC) that will be responsible for operationalizing the Power Forum.

The ITC's program for the Regional Power Trade Project will be implemented by a Project Management Unit (PMU). The PMU will be staffed by a project director, a finance manager, professional support staff, seconded specialists as needed, and a small administrative unit. Special working groups, including water experts, will be formed as needed during the formative period. The PMU, on behalf of the ITC, will retain consultants as needed to support the work program. Annex B provides suggested terms of reference for the project director and finance manager, as well as a suggested framework for the administrative, financial, and procurement functions of the PMU during its formative stage.

The management of the Power Forum and comprehensive basin-wide study components are conceptualized to proceed in parallel. The implementation of the Power Forum component, and the comprehensive basin-wide study will be directed by the ITC with assistance of the PMU. The basin-wide study will be supported by a small interdisciplinary team of project staff and by specialists, who will be sourced through technical assistance contracts from the region, the rest of Africa, and internationally as appropriate.

Important component activities include the compilation of a compendium of best practices and case studies on multipurpose hydropower coordination regimes, review of regulatory frameworks for regional power trade, a "blue chip" study on public-private partnership models for financing hydropower projects, review of regulatory regimes in the Nile Basin countries for environmental impact assessments, and the dissemination of this information through national workshops. In addition, a "drawdown"[8] support facility fund will be established for financing special studies as well as specific support that will be made available based on demonstrated national need that contributes to regional power trade issues. Specific country to country experience exchange and advisory support will be provided through the drawdown facility to encourage "learning by doing" and can also provide seed money to initiate institutional efforts, such as private sector participation models, if desired (i.e., for preparation of proposals for mobilizing technical assistance and financial resources).

[8] A "drawdown" facility is one which would enable Basin countries to gain access to resources (in this case technical support, advice, and assistance) which are provided out of an established fund through mechanisms which minimize administration and bureaucratic procedures.

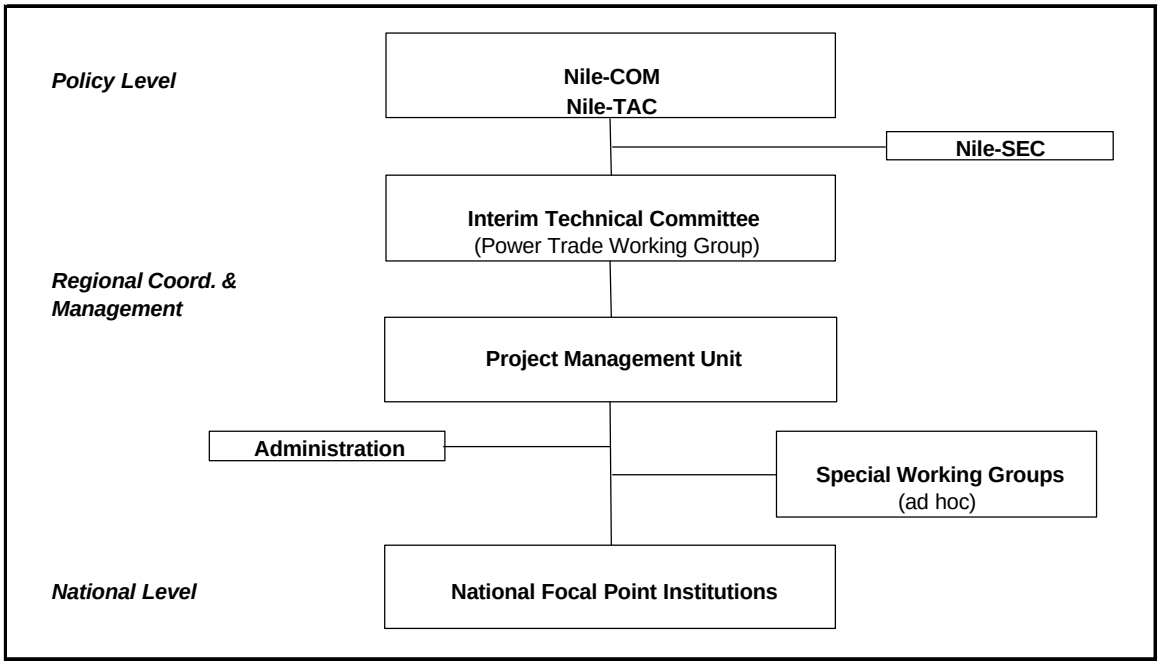

Figure 2. Organizational Structure of the Regional Power Trade Project: Formative Phase

4.1.2. Long Term (from March 2003)

The permanent institutional set-up of the Power Forum will be finalized by the ITC. It is likely to comprise a management committee and a technical committee.[9]

The management committee could serve as the apex body responsible for the overall management and policy direction of the Power Forum. The chairperson of the management committee could be the official spokesperson for the Power Forum. The members of the management committee could initially be appointed by the ministers responsible for electricity from each of the NBI countries. Two members would ideally be nominated from each country—one senior ministry official with primary responsibility for electricity matters and the second member could be the chief executive officer of the national power utility. Procedures for election of members of the management committee may be revised at a later stage.

It is anticipated that the technical committee would support the management committee and guide and supervise the technical work of the Power Forum. Each member of the Power Forum could be invited to nominate one senior technical staff to the technical committee.

The technical committee could be supplemented by special sub-committees or project working groups to examine specific issues or manage studies and investigations. All members in charge of transmission networks and system operation could be represented on technical sub-committees to be established for system operation, generation-transmission planning, and environmental monitoring. The latter sub-committee would interact with the Water Resources Project.

[9] The organizational structure may evolve further to accommodate changing conditions and requirements.

As power trade develops, a Power Forum trading team may be established to further identify and define trading options available to members, including contracts, bidding procedures, and settlement arrangements. Further, as power trading increases, a central monitoring activity for energy trading could be established, to assume the functions and responsibilities that in an initial phase can be handled through communication between national control centers.

Power Forum Activities and Time Frame

The Regional Power Trade Project will be presented via the appropriate channels to the ICCON meeting in June 2001. The ITC will thereafter commence the establishment of the Power Forum and initiate its first activities subject to the normal approval procedures of the NBI. These activities will take into account other NBI initiatives and will effect coordination and liaison where appropriate. The activities can be grouped as follows:

Institutional and Management Framework

- Establish PMU, appoint project director and finance manager
- Establish administrative unit and select necessary specialist/consultant support
- Investigate and review options for establishing the Power Forum as a legal entity
- Initiate dialogue with EAC, SAPP, and Kagera River Basin Organization
- Draft a proposed Interutility Memorandum of Understanding (IUMOU) or its equivalent, undertake necessary consultations according to established procedures, and facilitate the approval and ratification of the IUMOU.

Planning and Analytical Tools

- Develop information exchange protocols
- Establish and launch a Power Forum website on the Internet linked to the established Nile Basin website to facilitate dialogue between Forum members and well as external promotion of the Power Forum and its activities. This activity will be coordinated with the Nile Basin Decision Support System (DSS) component of the Water Resources Project
- Establish liaison and coordination with other Nile Basin initiatives, organizations, and stakeholder groups, for example in terms of training initiatives
- Initiate coordination with environmental initiatives under the NBI
- Establish Power Forum member reporting processes and requirements
- Create a regional power sector databank
- Initiate development of a long-term strategy for the Power Forum, with particular focus on how the forum can contribute to harmonization of power sector reform in the Nile Basin and the coordinated development and implementation of regulatory frameworks, particularly related to power trade
- Establish working group(s) for demand/supply studies and methodologies
- Convene workshops and meetings, focusing on planning and operation of power systems, regulation of power markets, and power trade.

Training and Skills Enhancement

- Initiate training and development needs assessment among the Power Forum members, regulatory agencies, and government ministries responsible for electricity matters
- Decide power sector specific training requirements
- Define program for assistance to government ministries responsible for electricity matters and regulators, taking into account other training initiatives under the NBI
- Define program for assistance to member utilities, taking into account other training initiatives under the NBI
- Initiate training of government, regulator, and utility officials in key areas of power trade, including demand forecasting, analysis of power generation options, transmission pricing, and regulatory aspects.

Financial Resource Mobilization

- Liaise with donors through ICCON meetings, in accordance with established NBI procedures
- Develop Power Forum documentation for investment promotion in cooperation with SAPs, including detailed project profiles
- Organize investment seminars for private investors and financiers in cooperation with SAPs.

Special Studies. Commission special studies important for the establishment of the Power Forum and to progress work aimed at stimulating power cooperation and trade. Such studies could include, but should not be limited to:

- Review of best practices in multi-purpose hydropower coordination regimes
- Review of institutional and regulatory frameworks to support regional power trade
- A "blue chip" study on review of public-private partnership models for financing and implementing hydropower projects
- Review of frameworks and procedures for environmental impact assessment of power projects in the various Nile Basin countries
- Other specialized studies, advisory services, and workshops/seminars.

4.2. Component 2: Comprehensive Basin-Wide Power Study

As an initial priority task of the Power Forum, a participatory process will be designed to advance the *Scoping Study of the Opportunities for Power Trade in the Nile Basin* into a comprehensive basin-wide study that will analyze power supply, demand, and trade opportunities in the context of multipurpose water resources development. Specific studies and projects resulting from the scoping study can be presented to the Eastern Nile and the Nile Equatorial Lakes SAPs for consideration for implementation.

The detailed basin-wide analysis will be used to inform the planning of multi-purpose river basin management in the SAPs. In conducting this study, special working groups of non-power experts (water resources managers, environmental specialists, etc.) will be formed to ensure that hydropower development issues are addressed in the broader context of integrated and multipurpose water resources development and management. The study will seek to follow best practices in options analysis, including extensive stakeholder investment and multi-criteria options assessments.

Given the complexity of the comprehensive basin-wide power study that has to integrate both power development and multipurpose projects analysis, this activity will be launched pursuant to a scoping study carried out under the supervision of the ITC of the Power Forum and in close collaboration with Nile Basin water resource specialists (for example, the Nile-TAC or the coordinating committee of the Water Resources Project). This scoping study will investigate, from a multi-objective perspective, data availability and data harmonization issues, and prepare a detailed terms of reference. Upon completion of a joint review by the PTWG and other appropriate SVP projects, such as the Water Resources and Environment projects, the comprehensive basin-wide study will be launched.

The activities involved under component 2 include:

- Conduct a scoping study to assess past national-level power and water resource management studies, investigate the availability of pertinent data and data harmonization requirements for a multi-objective study, and prepare a detailed terms of reference for conducting a comprehensive basin-wide study

- Invite proposals for the basin-wide study, award and launch the study, and manage and monitor study implementation

- Using the results of the basin-wide study, detail the vision and strategic focus of the Power Forum to more precisely define how the forum can assist the Nile Basin countries moving towards development of a regional power market.

Table 2. Summary Of Project Components

COMPONENT AND OUTPUT	COMPONENT LEVEL OUTPUTS	INDICATIVE BUDGET, MILLION US$
Nile Basin Power Forum *Output: The establishment of a power forum to support continued discourse and promote power trade among Nile Basin countries*	Power forum established including the project office Administrative arrangements formulated and put in place Drawdown support facility to provide advisory services established and operating Power forum website and activities launched	$6,847,800 including 10% contingency
Comprehensive Basin-Wide Study *Output: Basin-wide analysis of long-term power supply, demand, and trade opportunities in order to inform the planning of multi-purpose river basin management in the SAPs of the NBI.*	Detailed terms of reference for the basin-wide study drafted and reviewed by the ITC and appropriate SVP projects (ie, Water Resources Project) A working group is defined and established to launch and manage the study Project management of basin-wide study	$5,085,000 including 5% contingency
	Total Estimated Project Budget	**$11,932,800**

A detailed project budget for the first three-years is presented in Annex C.

5. PROJECT RATIONALE

5.1. The Merits of Power Trade

Power sector experts in the Nile Basin are aware that regional power trade can be a useful part of a strategy to increase and improve reliability of supply at a cost lower than that for isolated system operation. Power trade, albeit at modest levels, is already taking place between and among several Basin countries. Many Basin countries are either discussing power trade at increased levels or considering developing power trade in the near future, and are looking for suitable investments to realize this objective.

The potential benefits of power trade are related to cost saving in the supply of power from cooperation relative to the cost of independent expansion of national power systems. Such cost savings may arise from a reduction in the following:

- Operation costs due to economic power exchange
- Investment costs in additional supply due to least cost development of energy resources from a regional as opposed to a national perspective
- Spinning reserve requirements as a proportion of peak load
- Coincident peak load relative to average load.

Furthermore, significant environmental benefits could arise if regional power trade is developed on a least-cost basis. Such benefits could result from water conservation and land protection effects, and from a reduction in greenhouse gas and other pollutant emissions caused by a shift from thermal to hydropower based generation.

5.2. Reasons for Developing a Regional Power Market

Development of a regional power market requires establishment of a power pool concept. All power pools have common objectives but each may be considered unique in having to meet the specific requirements and characteristics of the participating countries electrical power networks and generation facilities and demand profiles. The objective is to be able to realize the potential benefits within individual country networks to the mutual economic advantage of all the interconnected

countries. Interconnection of countries with different daily and seasonal load profiles introduces diversity, which reduces the cost of expensive peak power generation. Furthermore the total amount of spinning reserve can be reduced, resulting in a reduction in generation plant requirements and overall system costs.

Power pools can be designed as “loose” cooperative or “tight” competitive pools—the latter requiring stricter adherence by pool participants to mandatory rules and requirements in return for greater economic benefits. Often, pooling arrangements are initially of the loose type, such as the SAPP. Over time, moves towards a tighter pool can then be realized.

5.3. From Loose Cooperative to Tight Competitive Power Pools

A loose power pool can offer many advantages without the need for continuous control. Such an arrangement provides opportunities for bilateral power purchase agreements and permits wheeling of power across the interconnected networks. Experience shows that, when interconnections are established as part of the creation of a power pool, other bidders and buyers enter the market and thereby introduce (or enhance) competition. Due to the fact that power systems are non-linear, the cost of generation, amount of transmission losses, and level of required ancillary services vary continuously with the electrical loading on the network. To achieve the maximum cost efficiencies, tight power pools are established with tele-control continuously monitoring all generators and identified network nodes. This creates a market where the real price of electricity is known for different times of the day and allows buyers to control their loads accordingly. Competition brings in independent power producers and ancillary service providers which, combined, result in an overall reduction in the delivered price of electricity.

5.4. Restructuring and Reform and the Impact on Power Trade

The restructuring of electricity supply industries is characterized by the unbundling[10] of vertically integrated power utilities to stimulate efficiency, competition, and new investment. After restructuring, the transmission system retains the role of a national electricity transmitter and system operator, with open access to the network being provided to both generators and consumers. In a regional context, this means that any generator can supply power through an open-access regional grid to end-users in other countries. Consequently, the choice of supplier for consumers becomes greater. This requires national transmission tariffs to be harmonized and regional wheeling charges developed for use of third-party networks.

5.5. Concerns for Self-Sufficiency or Cost of Compliance

Self-sufficiency is a normal concern for any country that has traditionally met all of the electrical energy requirements of its consumers, and had full control over the capital invested and the returns realized from generation and transmission assets. Entering into any cross-border agreement for the purchase of electricity, to either replace or defer investment in local generation, raises many concerns. Apart from political issues, such concerns normally relate to reliability of supply, fluctuations in various currencies, and the deleterious impacts that could arise from faulting of adjacent networks. With correctly negotiated cross-border purchases of electricity and adequate planning and design for the transmission interconnection, these concerns can be resolved and the benefits of electricity trading realized. In return for this, the normal agreements and requirements of a power pool do place certain obligations and performance requirements on its members, for example the need to contribute to overall regional system reserve capacity and assist in emergency situations.

5.6. Fair and Realistic Charges for Wheeling of Electrical Energy

There are numerous methods applied in the calculation of charges for the wheeling of energy from a seller to a buyer through an intermediary network. These vary from a very simplistic fixed rate charge to sophisticated charges calculated from dynamic pricing for the cost of electricity at identified nodes on the network. When introducing wheeling charges in a power pool, the simplistic approach is generally adopted initially. This can be as simple as a percentage of the value of the transported

[10] The separation of generation, transmission, and distribution (and supply).

energy. Thereafter, to achieve more cost reflective charges, considerable debate may ensue on the actual value of the assets being utilized, the proportional use of these assets and the increase, or reduction, of the transmission losses within the wheeling network.

5.7. Cooperative Planning and Operation of an Interconnected System

Any interconnection between previously isolated country networks will bring about both advantages and potential operational disturbances. However, interconnected networks need to be studied, planned, and operated as a single network. In order to achieve this objective, it is necessary for the technical planners and operators of the interconnected countries networks to be able to work together. In the generation planning of such interconnected networks, it is possible to consider options for new plants with increased economies of scale.

5.8. Impact of Disturbances on Neighboring Interconnected Networks

Spinning reserve margins for generation can be reduced within interconnected systems. During a disturbance on a neighboring interconnected network, either partial or considerable support can be provided by the interconnection. System studies should be undertaken to identify the level of this potential benefit. Another benefit that can be derived due to a partial loss of generation is the supply of emergency power over the interconnection.

A negative effect from an interconnection can be the influence of a fault on a network affecting the adjacent interconnected network. Another effect can be the dynamic oscillation between two countries generation pools interconnected through a long, high impedance interconnection. This may be resolved through increased control on generators.

5.9. Dealing with the Impact of Drought on Hydrogeneration

Most hydrogeneration systems are subject to seasonal performance, which is acknowledged in the design of the installation. In Africa, however, hydrosystems are often adversely affected by unpredictable drought. Where affordable, shortfall in hydrogeneration due to drought conditions is supplemented by higher cost, thermal generation. An interconnection with another country containing a different generation plant mixture, or whose rivers are supplied from a different catchment area that would not be similarly subjected to the drought, could be in a position to supplement the hydrogeneration shortfall.

5.10. Lessons Learned and Reflected in Proposed Project Design

There is abundant international experience in the design and development of regional forums, and evidence shows that the formation of the forum reflects the prevailing regional circumstances and the parties objectives for this type of regional institution. A review of about nine such regional organizations shows that they can be broadly categorized into two groups; (a) a forum that provides for information exchange, special studies, and training events in support of eventually forming regional energy markets—the forum is essentially a regional “market promoter,” and (b) a forum that supports explicitly the formation of regional electricity markets or power pools through information exchange, special studies, and specialized training— the forum itself becomes the regional “market maker.” While this distinction is indeed subtle, this categorization helps in understanding the motivation for the formation of regional forums. In our review of nine regional institutions, three fall into the “market promoter” category and six fall in the “market maker” category. A brief description of each of these institutions is presented in Annex D.

5.11. Value Added of Donor Support in this Project

For the integrated development of regional electricity markets in the Basin it is important to assure that all countries have effective power sector policies and regional cooperation to foster a regional dialogue and common understanding of good practices. In recent years there has been much heightened activity in investigating power trading opportunities in the region. Efforts to improve regional cooperation and coordination of power systems is seen as an essential step in ensuring effective power project planning capability at the national, sub-regional, and basin-wide level.

Donor support to the Nile Basin Regional Power Trade Project will bring a number of advantages to the riparian countries and thus add significant value by supporting the regional dimension that individual national activities cannot provide. The advantages include:

- *Leveling the playing field.* Providing means to countries to achieve similar quality level in terms of load forecasting and load research, through examples of good practice, and provision of advisory services when requested.

- *Project and program support.* Increasing capacity for project planning and support, through examples of good practice and methodologies, provision of training, and advisory services and development of technical guidelines when needed.

- *Knowledge transfer.* A power trade project-specific website will improve communication and establish a basin-wide knowledge base both at a regional unit and within national focal point institutions. This will also provide links across sectors, through other SVP projects.

- *Communication and transparency.* The power trade project website will provide information about the regional activities to a wider range of stakeholders in the Basin and thus is likely to increase transparency and confidence. The website will also directly aid in coordination of the SVP, the effective transfer of lessons learned to emerging SAPs, and other initiatives in the Basin.

- *Basin-wide integrated planning.* The comprehensive basin-wide study will be based on agreed formulations and input data, providing a common framework for analysis, informed dialogue, and rational decisionmaking from a regional perspective. The basin-wide hydropower model, together with a "tool box" of hydropower analysis tools at the national level, provide the tools to enhance hydropower planning at regional, sub-regional, and national levels. These tools will also benefit the identification and evaluation of cooperative projects within SAPs.

- *Ownership.* This is the first basin-wide effort to develop a regional power trading architecture that will be developed in the Basin and through active participation of and collaboration among all countries.

- *Training and long-term education* of staff will strengthen technical capacity and facilitate self-sufficiency in the planning and development of hydropower and transmission interconnection projects.

6. ISSUES REQUIRING ATTENTION

In developing regional power trade and in establishing a power forum, a variety of policy, economic and commercial, financial, technical, institutional, social, and environmental issues will need to be considered. It is also important to emphasize that many of the issues presented here will be addressed over the long term as the institutional framework for regional trade progressively evolves.

6.1. Policy Issues

Key policy issues that need consideration include:

- Harmonization of national policies on self-sufficiency in electricity supply with the regional objectives and scope of the Power Forum
- Harmonization of power sector reforms, most notably issues pertaining to power trade and access to and use of national transmission systems.

6.2. Economic and Commercial Issues

Economic and commercial issues requiring attention include:

- Policies and principles for pricing of transmission services
- Access to relevant economic and cost information to determine and compare the cost of supply for various power generation and transmission options with regional implications
- Creation of national power markets with active participation by demand-side participants to compliment and enhance the performance of regional power trade
- Principles, instruments, and procedures for political risk mitigation in developing regional power projects (to facilitate investment and financing)
- Development of an investment climate conducive to realization of power sector developments with a regional focus, for example appropriate energy laws and regulations and currency convertibility.

6.3. Financial Issues

Financial Parameters and Valuation of Existing Assets for Calculation of Wheeling Charges. In addition to calculating the portion of the transfer capability of assets used for wheeling, it is also necessary to agree on the financial value of these assets (to estimate a basis for calculation of a "use of network charge"). This can often pose a problem, particularly if the assets are more than 25 years old—the normal period for amortization for power system assets. Consensus can, however, be reached using a reasonable approach, such as a depreciated value of present-day replacement cost with a minimum percentage residual value.

Producing an Investment Plan of Financially Justifiable Projects. The high capital cost associated with new generation plants optimally sized beyond the needs of the host country, as well as the transmission interconnections to export the surplus capacity, are often beyond the financial capability of the host country. Hence, such investments need to be funded by private investment or through joint ventures. A well-prepared optimal power pool plan, accepted by all the interconnected countries,[11] provides the best foundation for a bankable document for funding of such investments.

6.4. Technical Issues

Technical Issues to be Considered for the Realization of Regional Power Trade

Operating Procedures for an Interconnected System. The control staff in the national control centers of the individual countries, coupled with a transmission interconnection, should be able to comply with all contractual requirements and identified technical considerations. For this purpose, it is necessary to reach consensus on the operating procedures to be applied to the interconnected system.

Appropriate Criteria for Generation and Transmission Planning. It is normal for each country to have established planning and operating criteria for both generation plant and the transmission grid. Such criteria are applicable to the nature of the plant as well as the configuration and economics of operating the national grid. When such isolated country networks are interconnected, it is necessary to reach consensus on the criteria and process to be adopted for the planning and operating of such an interconnected system.

Identifying What Trading Could Take Place Through Existing Networks. The imposition caused by wheeling of power through an existing network, following interconnection with adjacent countries networks, must be limited to a level that does not impose any reduction in quality of supply or service to consumers already supplied from the network. Similarly, when any contingency arises that makes the system incapable of supporting both the national consumers and the power being wheeled, the national consumers shall be given preference for continuity of supply.

Negotiation of Bilateral or Wheeling Short-Term Contracts to Test Assumptions and Procedures. Electricity trading contracts should not be long term in order that the contracting parties

[11] This implies agreement on the sizing and location of the next generation station, together with the associated transmission strengthening.

are able to gain experience with such an arrangement. However, regional trading often requires capital expenditure on an interconnection. This tends to result in the signing of bilateral trading agreements in terms of power purchase agreements. Such agreements are normally required for long periods for the investment to be viable and the risks to investors and financiers acceptable. However, there should be some flexibility to renegotiate the conditions of these contracts. Wheeling contracts, on the other hand, normally utilize spare capacity in existing networks and do not require any (or limited) capital investment to be made.[12]

Compilation of a Regional Demand Forecast to Identify Generation Shortages and Surpluses. Following the establishment of an interconnected system between countries, the joint planning activity would need to merge the individual national demand forecasts into a regional demand forecast and compare it with the generation shortages and surpluses in the interconnected countries. This analysis would also need to take account of transmission constraints inhibiting the free flow between all generators and loads.

Development of a Pool Plan Without Transmission Constraints to Prioritize Options and the Potential Location of New Generation. Based on the regional demand load forecast and existing generation plant output capability, it is possible to develop a generation pool plan that will identify the need, available options, and potential locations of future generation. This plan should be based upon a participatory approach and multicriteria options assessment which addresses social and environmental aspects, as well as technical, economic, and financial issues. An integrated approach to energy and water planning and management is also critical.

Development of an Optimal Pool Plan Including Transmission Requirements, Minimized Losses, and Ancillary Services. The generation pool plan, which has identified options, as well as the ideal order for siting and sizing of new generation plants, needs to be refined by adding the transmission costs necessary to integrate these new points of generation with the forecasted loads. This analysis must also include the cost of transmission losses and ancillary services for the various combined generation and transmission scenarios. Environmental and social issues, as well as stakeholder involvement should be integrated into the planning process.

Consideration of the Possible Influence of any Adjacent Power Pools on the Optimal Pool Plan. Where there is a possibility in the development of a power pool that it could be connected to an established power pool in an adjacent geographical area, then any planning and operating investigations would need to be done in conjunction with the technical planners and operators of the established power pool. Only thereafter should consideration be given to interconnection of the new power pool to an existing power pool.

Performing Stability Studies on the Optimal Plan to Establish its Dynamic Behavior. Transmission networks in Africa are characterized by limited power transfer levels over extremely long distances. Such high impedance interconnections give rise to the potential for dynamic instability within interconnected networks. It is, therefore, imperative that not only power transfer studies are undertaken, but that all proposals are checked for their stability capability.

6.5. Institutional and Capacity-Building Issues

Institutional and capacity-building issues of importance to the realization of the Power Forum include:

- Recognition and incorporation (where possible) of practices and experiences of other regional organization involved in power sector cooperation and trade, for example CEPLG and SINELAC in DRC east, Burundi and Rwanda, the EAC and the SAPP (of which Tanzania is a member)

[12] The exception would be where wheeling across a country is required beyond the established planning criteria capabilities of the existing network and new transmission strengthening is required. Under these circumstances, a wheeling agreement would be required to cover this capital expenditure.

- Building of appropriate institutional capacity and capabilities at both national and regional level to successfully handle increasing power trade, including assessment of training needs and development of appropriate training programs

- Formalization of necessary agreements and preparation of appropriate documentation to control and guide the involvement of both governments, public utilities, and other future members of the Power Forum.

6.6. Environmental and Social Issues

Regional power trade in the Nile Basin carries with it a number of environmental and social aspects and implications. In line with best practice, it is important that environmental, social, and other safeguard issues are effectively integrated into the planning and design process in an "upstream" manner. Approaches to ensure this include:

- Use of strategic environmental and social assessments (SEA) as a tool for evaluation of options at the river basin or regional/sub-regional level
- Effective integration of environmental and social assessments into the project design process
- Promotion of broad-based consultation and transparency as part of the planning and implementation process
- Increased emphasis on evaluation and managing risks and sharing of benefits
- Provision of specialized training on environmental and social issues as related to energy and water planning management.

6.7. Telecommunications Issues

Efficient "real time" operation of regional power trade requires access to broadband telecommunication networks. Specific issues that need to be addressed include:

- Identifying the scope and potential for installation of fiber optic cables when installing transmission interconnections
- Developing the appropriate telecommunication and informatics infrastructure to facilitate power trading in "real time"
- Designing and developing data recording and communications architecture.

7. SUSTAINABILITY AND RISKS

Sustainability is understood here as the possibility for the riparian countries to continue the long-term project activities for establishing and operationalizing an organization responsible for regional power trade. The sustainability aspects are different for each of the two project components: the Power Forum component and the basin-wide study component.

7.1. Sustainability of the Nile Basin Power Forum Component

The Power Forum component will have an indefinite life span, and if the proposed approach is successful, additional resources will need to be mobilized at a later stage. The drawdown facility is a pilot scheme, and there may be a demonstrated need and demand to continue it beyond the life span of this project, assuming that the need and its effectiveness are demonstrated. Nevertheless, the work is only likely to be externally funded for a finite period. In the long term, as the "power pool" operation takes hold, and institutional capacity in the basin grows, a "pool user fee"[13] may be required for the sustainable operation of the project component.

The sustainability of the benefits of the Power Forum therefore depends on three factors:

[13] The administration of a power pool is usually performed by an independent entity, for example an independent systems operator. The administrative costs are recovered through a "pool users" fee levied on members of the power pool. The pool users fee is usually linked to a member's pool usage, annual turnover, system size, etc.

- The quality of the implementation of the project components
- The political commitment of governments to implement policy conducive to regional power trade and undertake necessary sector reforms
- The ability of governments to retain the services of the officials trained through the process, although the skills and knowledge attained will contribute to the common wealth of riparian countries, whether the individuals involved remain in public service or not.

A measure of the success of the project will be sustainable benefits resulting from it. It is envisaged that, with improved water resources management and coordinated power pool operation, the Nile resource management as a whole will be more sustainable. The sustainability of the Power Forum has three separate aspects:

- Institutional sustainability at the regional and national level
- Technical sustainability
- Access to information within national and between riparians.

Institutional sustainability at the regional level concerns the ability to continue the forum's functions beyond the project period. There is a financial need for investments in hardware and software as well as maintenance and support staff. Further, secondment of technical staff to the forum from the countries is needed. These staff will be responsible for the technical activities of the Power Forum. In cases where secondment is not appropriate, employment of regional experts will be needed. At the national level, and in the long term, the national power experts will have to provide timely information and their participation in developing the institutional infrastructure as in-kind contributions.

The technical sustainability of the Power Forum will be a function of the ability of their staff to respond to the needs of the Nile basin countries. National power experts need to collect and process data and information that will be used as inputs to the basin-wide study as well as other studies at the regional or sub-regional level. At the regional level there will be a need for the exchange of specific data so that basin-wide power planning and operations scenarios can be studied for ascertaining regional benefits.

In order to create the basis for the sustainability along the above lines, it is essential to create a momentum of Power Forum ownership, interest, and usefulness among the riparians during the project period. This momentum would best continue if financial requirements and dependence on assistance from outside the basin are minimized over the long term.

7.2. Critical Risks in the Nile Basin Power Forum Component

The most critical risks related to the Power Forum component are:

- Lack of riparian government commitment to the Power Forum development process resulting in reluctance to second qualified staff to the forum
- Lack of understanding within national water related institutions of the potential use of regional power trade in national water resource management and within related sectors for studies of development scenarios (that could result in inadequate support at the national level including a lack of collaboration on data inputs)
- Insufficient availability of the data and information needed to make regional benefits studies
- Lack of continued services of trained staff due to rotation or pursuance of other careers

In order to counteract the risks during the design and implementation of the Power Forum component the following actions and precautions should be included as far as possible:

- Match levels of ambition in the Power Forum as closely as possible with present and projected support capabilities of the riparian governments and develop the Power Forum in clear response to expressed needs

- Design the Power Forum component to include awareness raising, training, and mutual benefits sufficient to motivate the participants in the national NBI networks to provide input and in return have access to the benefits of Power Forum analytical tools
- Build up confidence and collaborative attitudes among the respective riparian institutions through openness and transparency in Power Forum operations and participatory development of the systems
- Provide training of trainers to maintain expertise within the region
- Include Nile Basin universities early on, so that an understanding of the regional power trade and the power forum forms part of the standard knowledge base of energy and engineering professionals in the region.

7.3. Sustainability of the Basin-Wide Study Component

The basin-wide study component is planned to provide a useful regional multi-purpose project analysis that will have a long-term perspective, thus sustainability is crucial.

7.4. Critical Risks in the Basin-Wide Study Component

Risks to the successful completion of the basin-wide study project component include:

- Lack of commitment to the process on the part of riparian governments
- Documents and outputs not being relevant to the needs of the riparian countries
- The development of dependencies on the services provided and the lack of adequate skills and abilities being developed within the riparian countries
- Selection of consultants that may claim but not have demonstrated relevant expertise.

These risk factors would be mitigated by the following actions and precautions:

- The objectives of the project need to be clearly understood and accepted by all the riparian countries. The fact that it is not the objective of the project to predetermine national policy must be stressed and rigorously observed.

- The processes, products, training, and skills building activities, as well as support provided by the project, must be in direct response to discernible, verifiable, and expressed demand from riparian countries.

- Consultation at all levels, both between the project and senior government officials in riparian countries, and between officials and the wide range of stakeholders and parties affected by policy development and implementation, is essential for success.

- It will be essential for governments to afford the proper priority to the development and implementation of SAP cross-border hydroelectric power and transmission interconnections projects, ensuring that appropriate senior staff are set the task of coordinating project identification and that the project development and implementation process are endorsed at the highest political level.

- Although this is essentially a capacity-building exercise, it does assume that competent personnel are appointed by the governments of the Basin and that the NBI activities enjoy the highest priority of the respective governments.

- Rigorous consultant selection criteria will be developed and implemented to ensure selection of consultants with demonstrated expertise and skills.

8. PROJECT PREPARATION AND PROCESSING

8.1. Evolution of the Shared Vision Program: A Coordinated Basin-Wide Program

The SVP evolved from four thematic areas, or pillars, as described in the NBI policy guidelines to a coordinated program of seven basin-wide projects between February 1999 and December 2000. The process, as summarized in Table 3, was executed and coordinated by the Nile-SEC, involved active participation of and guidance from the Nile-TAC, and received formal endorsement by the Nile-COM at critical milestones.

The final portfolio of SVP projects includes:

- Nile Transboundary Environmental Action
- Nile Basin Regional Power Trade
- Efficient Water Use for Agricultural Production
- Water Resources Planning and Management
- Confidence-Building and Stakeholder Involvement (Communications)
- Applied Training
- Socio-Economic Development and Benefit-Sharing.

Four of these are thematic projects, focusing on environment, power, agriculture, and water resources management, and three are facilitative projects related to confidence building and stakeholder involvement, training, and macro-economics. The thematic projects aim to provide a technical foundation, including common analytical frameworks, practical tools and demonstrations, and human capacity to support regional cooperation while the facilitative projects serve to forge a common vision and ensure long-term sustainability. The projects build on each other, and together will serve to provide an enabling environment for cooperative development and management.

The SVP projects are linked to each other and to the SAPs in important ways. For example, the information management system of the DSS component of the Water Resources Project will provide a common communication platform and information management system for all SVP projects. The regional river basin planning model of the DSS component will provide a tool for interacting with other sectors, such as environment and power, and integrating these issues in the identification and evaluation of potential SAP projects. At the same time, the Benefit-Sharing Project will develop and evaluate socio-economic development scenarios, which will provide the context for potential river development alternatives. The Environmental Project can provide information and a strategic framework to support power related analyses. The Regional Power Trade Project will also coordinate with the Applied Training and Stakeholder Involvement projects to share knowledge and expertise as relevant.

8.2. Detailed Project Preparation: A Multi-Country, Participatory Process

As noted above, detailed preparation of the individual projects in the SVP was driven by Nile-TAC, coordinated by Nile-SEC, and involved significant substantive input by Nile-TAC members. Detailed project preparation was a complex and highly participatory process, which involved national experts from each country, representing expertise in environment, power trade (ministry and utility perspectives), agriculture, water resources (technical guidelines and DSS experts), training, and communications. The project preparation process created a forum for interaction among the technical experts from different water-related sectors across the Basin. As such, the project preparation process has laid the foundation for broad-based support for project implementation. It is also worthwhile to note, that for many it was the first time that they were able to discuss common concerns with their colleagues from their neighboring and co-riparian countries.

For the Regional Power Trade Project, a Nile Basin PTWG was established. Two national experts—one from the respective national power utility and the other from the respective ministry responsible

for electric power—were appointed from each country to the PTWG. A consulting firm was employed to conduct a scoping study to assess the opportunities for power trade among the Nile Basin countries. The national power experts played a critical role in study review, data provision, and qualitative analysis. A power sector specialist from the World Bank's Africa Energy Unit facilitated the conduct of the scoping study and functioned as a liaison and power trade cluster anchor within the World Bank/UNDP/CIDA Nile Team. Over the past year, PTWG met on three different occasions.

At the inaugural meeting of the PTWG held in Entebbe in December 1999, power sector experts from the Basin countries met to discuss the scope and potential for regional power trade. Power sector experts are aware that regional power trade can be a useful part of a strategy to increase and improve reliability of supply at a cost lower than that for isolated system operation. Power trade, albeit at modest levels, is already taking place between and among several Basin countries. Also, many Basin countries are either discussing power trade at increased levels or considering developing power trade in the near future, and are looking for suitable investments to realize this objective. The Basin power sector experts recognized that there is a critical need for an institutional mechanism that would enable Basin countries to discuss and find ways to expand power trade in the Nile Basin. There was general consensus among the power sector experts for the establishment of a Power Forum to:

- Facilitate continued dialogue and cooperation among power utilities
- Collect and exchange information
- Share experience
- Increase awareness
- Support technical meetings
- Review and analyze common issues of interest
- Commission special studies relating to power trade
- Assist in developing the strategic framework and agreements for advancing power trade in the region.

At the second PTWG meeting in Addis Ababa in July 2000, the national power experts reviewed lessons of international experience in the role of regional power for fostering regional power trading arrangements. Power forums elsewhere in the world are proving to be an effective institutional mechanism to promote and develop power trade opportunities among regional groups of countries, such as those in southern Africa, the Mekong Region, Central and South America, the Black Sea region, the Baltic States, and the Middle East (their key features are summarized in Annex D). The PTWG members reviewed the evidence that establishment of a "regional forum" catalyzes the scope for power trade, and they consequently refined the contours of a preliminary outline of a power forum proposal, with the objectives of:

- Exploring and articulating the region's approach to developing power trade and the Forum's role providing assistance in that development
- Developing the Forum's detailed rules of organization and operation
- Facilitating the creation of the physical and institutional infrastructure for sub-regional and regional trade
- Assisting in development of sub-regional markets in the near-to-medium term.

At the third PTWG meeting in Harare in October 2000, following a study tour of the SAPP, the national experts provided critical input regarding project formulation as well as reviewed and revised project documents. This project document reflects riparian perspective on national and regional needs, project components which are deemed to be implementable and confer real benefits, and a project design based on lessons learned from other related projects in the region.

Table 3. Preparation of the Shared Vision Program

DATE	MEETING TYPE	LOCATION	KEY OUTCOMES
July 1998	Nile-TAC	Dar es Salam, Tanzania	Drafting of policy guidelines that define the SVP and four major thematic areas of the program
Feb 1999	Nile-COM and Nile-TAC	Dar es Salam, Tanzania	Adoption of the NBI Policy Guidelines and instruction by Nile-COM to prepare a portfolio of priority SVP projects for ICCON
May 1999	SVP Planning Meeting	Sodere, Ethiopia	Preliminary list of priority projects, including project goals and objectives, based on consultation and brainstorming by Nile-TAC members and two additional sectoral experts from each country
May 1999	Nile-COM and Nile-TAC	Addis Ababa, Ethiopia	Approval of list of priority projects and project preparation process
Sept 1999	Nile-TAC	Entebbe, Uganda	Based on output from Sodere planning meeting, development of project concept notes for seven priority projects and approval of a detailed project preparation process and schedule for each project
Dec 1999	Project Preparation 1	Entebbe, Uganda	Review and further development of draft project concept notes/documents by working groups (WGs). For each project, the WGs included a Nile-TAC member and national expert(s) from each country. A total of eight national experts were involved from each country. Each project was assisted by a lead consultant
Dec 1999 – Nov 2000	National Analysis and Consultations	Nile Basin countries	Lead consultants together with national experts prepare draft project documents. Depending on the project and country, national experts provided inputs through preparation of national reports, country consultations, and/or country visits by lead consultants
Jan 2000	Nile-TAC	Entebbe, Uganda	Review of progress in project preparation and further refinement of project concepts as warranted
Mar 2000	Nile-TAC	Delft, the Netherlands	Review of progress in project preparation and further refinement of project concepts/design as warranted
July 2000	Project Preparation 2	Addis Ababa, Ethiopia	Review and further development of detailed draft project documents by working group members for each project and Nile-TAC members
Aug 2000	Nile-COM and Nile-TAC	Khartoum, Sudan	Approval of SVP project portfolio and updated project summaries
Oct 2000	Nile-TAC	Via electronic mail	Review of draft final project documents
Dec 2000	Distribution of draft final project documents	Via express mail and electronic mail	Distribution of all English draft final project documents to all Nile-TAC members (French versions sent February 2001)
Mar 2001	Nile-COM	Khartoum, Sudan	Final approval of SVP project portfolio and project documents

ANNEX A.
NBI REGIONAL POWER TRADE PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

HIERARCHY OF OBJECTIVES	KEY PERFORMANCE INDICATORS	MONITORING AND EVALUATION	CRITICAL ASSUMPTIONS
Goal Ensure development of a regional market for power trade in the Nile Basin through cooperative power system planning and coordinated power system management to support the achievement of sustainable socio-economic development in the region	**Sector Indicators** Nile riparian countries develop the institutional framework for regional power trade cooperatively	**Sector /Country Reports**	**(from Goal to Shared Vision)** Continued willingness of riparian countries to pursue cooperative development of the Nile Political and economic stability of riparian countries
Project Development Objective Establish the institutional means to coordinate the development of regional power markets among the Nile Basin countries	**Outcome/Impact Indicators** Effective dialogue and cooperation among Nile Basin power utilities is established Strategic framework for advancing power trade in the region is developed Common understanding of the institutional and regulatory frameworks required to support power trade is enhanced (or achieved) Investment needs to facilitate power trade are identified	**Program/Project Reports** Reports to Nile-COM and Nile-TAC Nile-SEC annual reports and newsletters Donor supervision reports Reports to ICCON	**(from Objective to Goal)** High political support for the NBI continues with coordinated actions at the national level Overall NBI cooperation continues Successful ICCON process and continued donor support
Output from Each Component Support for regional power trade development and national capacities strengthened Capacity for successful preparation and management of joint projects enhanced Comprehensive basin-wide study facilitating an interdisciplinary team of power and water resources planners is completed	**Output Indicators*** Power Forum operational arrangements accepted by Interim Technical Committee Number of people trained and knowledge improved; specific project management skills strengthened Drawdown facility operating with agreed criteria Specialized advisory and consultancy services undertaken and successfully completed through drawdown facility Communication links established and website functioning as knowledge base and information management system for Regional Power Trade Project Regional and national local focal points nominated for study team. Regional river basin planning and hydropower system planning models developed and agreed, calibrated, and used to analyze real cases	**Project Reports** ITC quarterly reports Comparative evaluation of change of national-level, legal, and regulatory frameworks Midterm and project completion evaluations Training evaluation (assessment of actual knowledge transferred) ITC ongoing progress evaluations and project management reports External review and evaluation reports at critical milestones and at project completion	**(from Outputs to Objective)** NBI regional cooperation continues, backed by strong commitment at national levels Adequate regional level implementation and management capacity to ensure basin-wide coordination Adequate national level institutional capacity and cooperation to implement and sustain project Qualified staff available and retained to effectively implement and sustain project Riparians willing to reach consensus and share information Sufficient donor interest and funding available

NBI REGIONAL POWER TRADE PROJECT DESIGN SUMMARY LOGICAL FRAMEWORK (CONT'D.)

HIERARCHY OF OBJECTIVES	KEY PERFORMANCE INDICATORS	MONITORING AND EVALUATION	CRITICAL ASSUMPTIONS
Project Components/Sub-components *	**Inputs (budget for each component) and Indicative Budgets**	**Project Reports**	**From Components to Outputs**
Power Forum Established Project management team in place Office administration set-up Monitoring and evaluation system in place Drawdown support facility established	$4.18 million	Project manual addressing administrative, work plan, budget, staffing, QA, and M&E issues Financial audits Needs assessments Basic guidelines and compendium of good practice for policy formulation and implementation Training course materials Criteria for drawdown facility	Work program meets needs of the countries Sufficient trained staff available and retained nationally to participate efficiently Consensus reached on criteria for drawdown facility Project component appropriately funded, particularly drawdown facility
Institutional Arrangements and Power Forum Operations Support ITC quarterly meetings Website development Draft interutility memorandum Drawdown operational Capacity-building needs assessment Training courses	$2.66 million	Power Forum operations manual addressing administrative, work plan, budget, staffing, QA, and M&E issues Needs assessments Practical guidelines and knowledge base for project planning and management Training course materials Criteria for drawdown facility	Quality consultants retained expeditiously Sufficient trained staff available and retained nationally to participate efficiently Timely completion of capacity-building needs assessments
Comprehensive Basin-Wide Study Guidelines for collection, processing, analysis, and exchange of information Technical integrated hydropower and water management systems development and application Inform the planning of multi-purpose river basin management in the SAPs	$5.10 million	Technical reports, needs assessments, user manuals, QA reports, and training materials Guideline documents for information exchange, QA manuals, and inspection of information being exchanged Multipurpose modeling, analysis, and training program assessments	Quality training professionals retained expeditiously Qualified, motivated staff, availability of other resources, and collaborative networks established and functioning Data availability and model requirements compatible and yielding results within acceptable limits of accuracy Regional consensus on extent of data exchange reached Model inputs are credible and accurate and information exchange following agreed procedures

*Note: *Gender targets for training and capacity building activities will be applied*

ANNEX B.
PROPOSED ORGANIZATIONAL FRAMEWORK FOR PROJECT MANAGEMENT UNIT DRAFT TERMS OF REFERENCE[14]

A. Background

Under the Nile Basin Initiative SVP, a Regional Power Trade Project is expected to be implemented over a period of three years. The Regional Power Trade Project has two main components, a Nile Basin Power Forum and a comprehensive basin-wide study. The Power Forum component will entail the establishment of an institutional mechanism to launch and conduct several specialized studies as well as preparing the groundwork for an eventual regional power trading arrangement.

To facilitate and monitor the overall implementation of the Power Forum, the Nile riparians intend to establish a project management unit (PMU) of the Power Forum component of the project. The project director, finance manager, and other professional support staff (such as a project accountant) will form the PMU. The PMU will be responsible for administration of consultant contracts, collecting and maintaining a projects database and filing system of all records and information on all contractual documentation pertaining to the Power Forum and comprehensive basin-wide study components of the project. The PMU will also establish a monitoring, evaluation, and reporting system satisfactory to the World Bank and/or relevant donor agencies. The project director will liase with other regional entities as well as other relevant SVP projects.

B. Scope of Work

The project director will be accountable for implementing the different activities under the project components. This includes oversight and reporting on the progress made on the various work program activities. As a matter of priority, the project director will prepare an operations manual within the first eight weeks of the inauguration of the PMU. The proposed project components will be implemented over a maximum period of 36 months. During this time, the project director will be responsible:

- To procure goods and services in accordance with procurement procedures of World Bank and/or relevant donor agencies, and to monitor the procurement process (delivery of equipment as per the specifications and the recruitment of consultants, the preparation of reports in accordance with the terms of reference, etc.). The consultant should set up electronic spreadsheets and document files so that information on the status of each activity is available on a monthly basis

- To prepare withdrawal requests and monitor the budget for each activity to ensure that activity budgets and timetables are adhered to

- To follow up on the status of consultancy studies, including the agreed work plans of individual consultancy assignments, the status of and progress on training programs, etc. to ensure that schedules are met and the quality of consultancy outputs is satisfactory

- To prepare quarterly progress reports to the World Bank and/or relevant donor agencies covering procurement, disbursement, and completion of assignments for each activity, and to submit the consolidated report to the Nile-TAC, World Bank, and/or relevant donor agencies in a timely manner and as per the agreed progress reporting format

- To ensure that the financial reporting and accounting systems adhere to the accounting requirements under World Bank and/or relevant donor agency guidelines, including the annual audit of project accounts

[14] Subject to change pursuant to Nile-COM meeting in December 2000 discussions on SVP implementation arrangements.

- At the completion of each activity, to prepare a brief write-up on the outcome of each activity (whether procurement went smoothly, the budget was met, the accomplishments and/or shortfalls of the particular activity, etc.) that could serve as a basis for preparation of an annual report on the project.

The finance manager, with the assistance of professional staff, will perform the following duties:

- Set-up the necessary accounting books and codes and prepare an accounting and recording system in accordance with World Bank and/or relevant donor agencies' accounting guidelines
- Assist the project director in the preparation of an annual budget
- Verify payments approved by the project director to ensure that they are in accordance with the already approved budgets and disbursement categories and properly supported by relevant documents
- Prepare payment vouchers and disbursement applications in accordance with World Bank and/or relevant donor agencies' accounting guidelines
- Prepare check payments
- Record all transactions in appropriate accounts and categories, including maintenance of a fixed asset register
- Prepare monthly bank reconciliation statements for the special account and other bank accounts
- Prepare monthly financial statements to reflect project status
- Prepare replenishment applications for the Drawdown Facility for approval by the project director
- Prepare actual expenditure versus budgets on monthly basis
- Prepare project financial expenditures and commitments to be included in the summary quarterly project progress reports
- Prepare annual project financial statements for audit as required by World Bank auditing procedures
- Attend to external auditors' matters
- Prepare any other reports as may be directed by the project director from time to time.

C. Reporting Requirements

The project director will set-up an office in _____at a premise provided by the Government of _____'s Ministry responsible for power sector. A budget for office set-up (furniture, computers, faxes, etc.) and a vehicle for the project director is provided for under the project. As noted, the project director, with the assistance of the finance manager, will be responsible for preparing quarterly progress reports to the Nile-COM/Nile-TAC/relevant donor agencies in sufficient detail, and liaising with World Bank staff on a regular basis electronically, as well as through periodic supervision missions. In addition, the project director will establish specialized working groups to oversee the implementation of all activities of the project. On a quarterly basis, the project director will report to the ITC of the Power Forum. In addition, the project director will be required to provide necessary and requested reports on the project components to the ITC, the World Bank, and/or relevant donor agencies.

Budget

The project director's assignment will run for a maximum of 36 months. The monthly salary will be $_____ gross (i.e., including taxes). The total estimated budget envelope will be $_____.

The finance manager's assignment will run for a maximum of 36 months. The monthly salary will be $_____ gross (i.e., including taxes). The total estimated budget envelope will be $_____.

Specialized professional consultants such as project accountants will also be retained for a maximum of 36 months. The monthly salary will be $_____ gross (i.e., including taxes). The total estimated budget envelope will be $_____.

Component 1: Power Forum Activities and Time Frame

The Regional Power Trade Project will be presented via the appropriate channels to the ICCON meeting in June 2001. The ITC will thereafter commence the establishment of the Power Forum and initiate its first activities subject to the normal approval procedures of the NBI. These activities will take into cognizance other NBI initiatives and will effect coordination and liaison where appropriate.

The activities can be grouped as follows:

Institutional and Management Framework

- Establish PMU; appoint project director and project manager
- Establish administrative unit and select necessary specialist/consultant support
- Investigate and review options for establishing the Power Forum as a legal entity
- Initiate dialogue with EAC, SAPP, and Kagera River Basin Organization
- Draft a proposed Interutility Memorandum of Understanding (IUMOU) or its equivalent, undertake necessary consultations according to established procedures, and facilitate the approval and ratification of the IUMOU.

Planning and Analytical Tools

- Develop information exchange protocols
- Establish and launch a Power Forum web-site on the Internet linked to the established Nile Basin web-site to facilitate dialogue between forum members as well as external promotion of the Power Forum and its activities—this activity will be coordinated with the Nile Basin DSS component of the Water Resources Project
- Establish liaison and coordination with other Nile Basin initiatives, organizations, and stakeholder groups, e.g., in terms of training initiatives
- Initiate coordination with environmental initiatives under the NBI
- Establish power forum member reporting processes and requirements
- Create a regional power sector databank
- Initiate development of a long-term strategy for the Power Forum with particular focus on how the Forum can contribute to harmonization of power sector reform in the Nile Basin and the coordinated development and implementation of regulatory frameworks, particularly related to power
- Establish working group(s) for demand/supply studies and methodologies
- Convene workshops and meetings focusing on planning and operation of power systems, regulation of power markets, and power trade.

Training and Skills Enhancement

- Initiate training and development needs assessment among the Power Forum members, regulatory agencies, and government ministries responsible for electricity matters
- Decide power sector specific training
- Define program for assistance to government ministries responsible for electricity matters and regulators, taking into account other training initiatives under the NBI
- Define program for assistance to member utilities, taking into account other training initiatives under the NBI
- Initiate training of government, regulator, and utility officials in key areas of power trade, including demand forecasting, analysis of power generation options, transmission pricing, and regulatory.

Financial Resource Mobilization

- Liaise with donors through ICCON meetings in accordance with established NBI procedures
- Develop Power Forum documentation for investment promotion in coordination with SAPs, including detailed project profiles
- Organize investment seminars for private investors and financiers in coordination with SAPs.

Special Studies. Commission special studies important for the establishment of the Power Forum and to progress work aimed at stimulating power cooperation and trade. Such studies could include, but should not be limited to:

- Review of best practices in multi-purpose hydropower coordination regimes
- Review of institutional and regulatory frameworks to support regional power trade
- A "blue chip" study on review of public-private partnership models for financing and implementing hydropower projects
- Review of frameworks and procedures for environmental impact assessment of power projects in the various Nile Basin countries
- Other specialized studies, advisory services, and workshops/seminars.

Component 2: Comprehensive Basin-Wide Analysis of Long-Term Power Supply, Demand, and Trade Opportunities

As an initial priority task of the Power Forum, a participatory process will be designed to advance the *Scoping Study of the Opportunities for Power Trade in the Nile Basin* into a comprehensive basin-wide analysis of long-term power supply, demand, and trade opportunities. Specific studies and projects resulting from the Scoping Study can be recommended for implementation as part of the Eastern Nile and the Nile Equatorial Lakes SAPs.

The detailed basin-wide analysis will be used to inform the planning of multi-purpose river basin management in the SAPs. In conducting this study, special working groups of non-power experts (water resources managers, environmental specialists, etc.) will be formed to ensure that hydropower development issues are addressed in the broader context of integrated and multipurpose water resources development and management. The study will seek to incorporate best practice in options analysis, including the use of stakeholder consultation.

Given the complexity of the comprehensive basin-wide study that has to integrate both power development and multipurpose projects analysis, this activity will be launched pursuant to a scoping study carried out under the joint supervision of the PTWG and the Water Resources Project. This scoping study will investigate, from a multi-objective perspective, data availability and data harmonization issues and prepare a detailed terms of reference. Upon completion of a joint review by the PTWG and the appropriate SVP Project (ie, Water Resources and Environment projects), the comprehensive basin-wide study will be launched.

The activities involved under Component 2 include:

- Conduct a scoping study to assess past national-level power and water resource management studies, investigate the availability of pertinent data and data harmonization requirements for a multi-objective study, and prepare a detailed terms of reference for conducting a comprehensive basin-wide study
- Invite proposals for the basin-wide study, award and launch the study, and manage and monitor study implementation.

Using the results of the basin-wide study to detail the vision and strategic focus of the Power Forum will more precisely define how the Forum can assist the Nile Basin countries to move towards development of a regional power market.

D. Qualifications and Recruitment Procedure

Qualifications

The project director and the finance manager must show competence in discharging his/her duties, in carrying out pre-defined activities, and should posses the following experience and qualities:

- A holder of at least a first degree from a recognized university; for the project director, first degree must be in Engineering followed by graduate work in Management; for the finance manager, first degree must be in Accounting or Commerce, and must possess accreditation from a professional accounting organization

- Relevant work experience of not less than ten years for the project director and not less than five years for the finance manager, with particular experience in the management and oversight of donor-funded projects, preferably from their commencement to their completion in all phases—management, procurement, monitoring, and report writing required by the government and donors

- A minimum of five years in the procurement of goods and services following donor/international procurement regulations, including procurement management and oversight of sizeable international projects

- Excellent communication skills both oral and written in English (and preferably French), demonstrated ability to work in MS Office software products, and ability to effectively work in teams.

Special Requirements

Conflict of Interest. Please refer to the Para 1.9 (b) of the World Bank's consultancy guidelines which states: consultants or any of their affiliates shall not be hired for any assignment that, by its nature, may be in conflict with another assignment of the consultants. As an example, consultants hired to prepare engineering design for an infrastructure project shall not be engaged to prepare an independent environmental assessment for the same project, and consultants assisting a client in the privatization of public assets shall not purchase, nor advise purchasers of, such assets.

Eligibility. Please refer to para 1.10 (b) of the World Bank's consultancy guidelines which states: government owned enterprises in the borrower's country may participate only if they can establish that they are legally and financially autonomous and operate under commercial law. No dependent agency of the Borrower or Sub-Borrower of the project or their employees shall be permitted to submit or participate in a proposal for the provision of consulting services under the project.

E. Selection and Evaluation Procedure

The selection and evaluation procedures will follow the World Bank and/or relevant donor agencies guidelines for the recruitment of consultants, and will abide by NBI guidelines.

ANNEX C.
NBI REGIONAL POWER TRADE: THREE YEAR BUDGET

PROJECT COMPONENT DESCRIPTION	INDICATIVE COSTS, US$MILLION
Component 1. Nile Basin Power Forum	
Sub-component 1: Power Forum set-up and operational costs	
Project director, project manager, professional staff, and administration	$1,300,000
Office furniture	$100,000
Office hardware and software including proprietary models	$300,000
SVP Coordination	$75,000
Monitoring and evaluation system	$75,000
Drawdown facility	
Review of best practices in multi-purpose hydropower coordination regimes	$300,000
Review of institutional and regulatory frameworks to support regional power trade	$250,000
A "blue chip" study on review of public-private partnership models for financing hydropower projects	$500,000
Review of frameworks and procedures for environmental impact assessment of power projects	$350,000
Other specialized studies, advisory services, and international workshops/seminars	$450,000
Total	$3,700,000
Contingencies at 10%	$370,000
SVP Coordination and Quality Assurance at 3%	$111,000
Total for sub-component 1: Power Forum set-up and operational costs	**$4,181,000**
Sub-component 2: Institutional functions including training and financial resource mobilization	
ITC quarterly meetings	$300,000
Web-site development, maintenance, newsletters	$200,000
Telecommunications set-up and maintenance	$180,000
Development of power sector database	$150,000
Power Forum strategy development	$150,000
Development of Interutility MoU	$180,000
Training needs assessment, definition of specific training requirements and program development	$150,000
Training delivery (2 courses per year – policy/regulatory and technical)	$300,000
Organize study tours – 2 tours – Scandinavia, United States	$300,000
Marketing (production and distribution of materials + visits)	$150,000
Development of detailed investment profiles for Subsidiary Action Programs	$150,000
Business Roundtables and Investor Seminars	$150,000
Total	$2,360,000
Contingencies at 10%	$236,000
SVP Coordination and Quality Assurance at 3%	$70,800
Total for sub-component 2: Power Forum Institutional Functions	**$2,666,800**
Total for Component 1. Nile Basin Power Forum	**$6,847,800**
Component 2. Comprehensive Basin-Wide Power Study	
Conduct Stage I – Project Preparation	$500,000
Conduct Stage II – Project Implementation	$4,000,000
Total	$4,500,000
Contingencies at 10%	$450,000
SVP Coordination and Quality Assurance at 3%	$135,000
Total Component 2. Comprehensive Basin-Wide Power Study	**$5,085,000**
Total Estimated Three Year Budget for Regional Power Trade Project	**$11,932,800**

ANNEX D.
REVIEW OF INTERNATIONAL REGIONAL POWER MARKETS

The establishment of a power forum as part of the NBI will provide great benefits because such a forum will facilitate exchange of information about best practices and experiences in power trade matters. Such an exchange of information and know-how will help develop the enabling environment for promoting regional power trade and investment.

There is abundant international experience in the design and development of regional forums, and evidence shows that the formation of the forum reflects the prevailing regional circumstances and the parties' objectives for this type of regional institution. A review of about nine such regional organizations shows that they can be broadly categorized into two groups; (a) a forum that provides for information exchange, special studies, and training events in support of eventually forming regional energy markets—the forum is essentially a regional "market promoter" and (b) a forum that supports explicitly the formation of regional electricity markets or power pools through information exchange, special studies, and specialized training—the forum itself becomes the regional "market maker." In our review of nine regional institutions, three fall into the "market promoter" category and six fall in the "market maker" category. A brief description of each of these institutions is presented below.

Regional "Market Promoters"

The Commission de Integracion Electrica Regional (CIER). CIER was established in 1964 on the basis of a proposition approved during the First Regional Electrical Integration Congress, an initiative of the Uruguayan Electric Sector Authorities. CIER's main objective is to promote and encourage the integration of electricity markets in South America. Current CIER members include 198 electricity companies from 10 South American countries: Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela. In addition, CIER has six associate members that are utilities from countries outside the region (UK, France, Spain (2), Mexico, Portugal).

Asia Pacific Economic Cooperation's (APEC): Energy Working Group and the Regulators' Forum. The Energy Working Group and the Regulators' Forum began as the Electricity Working Group and the Electricity Regulators' Forum in 1990. Their mandate expanded to include other forms of energy and the name was changed accordingly. The participants are from the following APEC countries: Australia, Canada, PRC, Indonesia, Japan, Republic of Korea, Mexico, Papua New Guinea, Philippines, Singapore, Chinese Taipei, Thailand, and USA. The Working Group contributes to decision-making through open and frank discussion. The Regulators' Forum facilitates information sharing on power sector regulation and responds to requests from APEC Ministers. The Working Group and the Regulators' Forum have established business networks to provide the views of the business sector, and supports events such as seminars, training, and technology demonstrations. A business sector/ministerial dialogue is held in conjunction with each Energy Ministers' meeting.

The Association of South East Asian Nations (ASEAN) Energy Cooperation Agreement and ASEAN Centre for Energy (ACE). ACE was established in 1999, replacing the ASEAN-EU Forum. The ten member countries are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. ACE's mandate is to catalyze the growth and development of ASEAN through energy cooperation. ACE coordinates, manages, and monitors the implementation of the ASEAN Plan of Action. The current ASEAN Action Plan includes the ASEAN Power Grid. ACE's working group on electricity and the ASEAN Heads of Power Utilities and Authorities provide input and work with ACE to implement plans in the electricity sector. ASEAN countries are considering forming a joint venture to invest in and operate regional transmission lines.

Table D1. International Regional Power Forum Experience: Comparison of the "Market Promoter" Model

ORGANIZATION	APEC ENERGY WORKING GROUP	APEC REGULATORS' FORUM	ASEAN CENTRE FOR ENERGY	CIER
AUSPICES	APEC Regional Organization	APEC Regional Organization	ASEAN Regional Organization	None
SCOPE	Energy, power, domestic, and regional	Energy, power, domestic, and regional	Energy, power, domestic, and regional	Electricity trade
PRIMARY OBJECTIVE	Maximize the energy sector's contribution to the region's economic and social well being while mitigating the environmental effects of energy supply and use; contribute to decisionmaking	Contribute to development of an efficient sector and regulatory arrangements that are conducive to business sector development	Serve as a catalyst for economic growth and development of ASEAN through national and joint activities on energy	Promote and encourage the integration of the electric markets in South America
PRIMARY OBJECTIVE-ELECTRICITY	Mobilizing environmentally responsible investment in power infrastructure	Contribute to development of an efficient electricity sector and regulatory arrangements that are conducive to business sector development	Manage and facilitate the ASEAN goals for the electricity sector – to Develop the Trans-ASEAN power grid, to promote private investment, and implementing organization-Heads of ASEAN Power Utilities/Authorities	Forum for exchange of information, knowledge, and experience; promote investment and business relations
TASKS/ACTIVITIES	Seminars, training courses, and information exchange activities; publish energy statistics; manuals on "best practices;" web-site to facilitate power infrastructure development	Facilitates information sharing on all aspects of power sector regulation; responds to requests from ministers	Coordinates manages, and monitors ASEAN Action Plan; provides technical coordination and facilitates the task of the implementing organizations	Studies on specific problems, special seminars, training, publications, and data bank
INTERNAL ORGANIZATION	[TBD]	Government regulators and key advisors; ad hoc forum for cooperation in power infrastructure	Governing Council, Executive Director, and Secretariat	Central committee and national committees, technical committees, and support by Secretariat (Exec. Dir. and four Sr. staff)
FORMAL BUSINESS NETWORK	Yes, Business Network with two reps from each country	Yes	No	Yes
EXTERNAL REPORTING	APEC Leaders and Energy Ministers	APEC Leaders and Energy Ministers	Consultative committee of senior officials of ASEAN economic ministries	None
FINANCING	Members and business partners	Members and business partners	Donors and member contributions	Member contributions of constant quota plus proportional amount (MW-based)

Regional "Market Makers"

Baltic Ring Electricity Cooperation (BALTREL). BALTREL was formed in 1998 on the recommendation of the Baltic Ring Interconnection study. The regional electricity market is under formation. BALTREL's initial activities include studies to develop common rules for the Baltic electricity market and to develop methods to implement joint activities. BALTREL's mandate recently expanded to include gas interconnections. Participating organizations are the 18 utilities and companies that participated in the study from the countries of Belarus, Denmark, Estonia, Finland, Latvia, Lithuania, Norway, Poland, and Sweden.

Greater Mekong Sub-Region. The formal organization and regional market are under formation. An exploratory, informal organization —the Greater Mekong Sub-Region Electric Policy Forum (EPF)—was formed in 1995, and its Experts Working Group (EWG) was formed in 1998. The Mekong ministers responsible for power endorsed the EPF's draft policy statement on power trade in January 2000, allowing the regional market to proceed, including the formation of market-managing institutions. The EWG is now drafting a memorandum of understanding for the establishment of a regional electricity market. Participating organizations are the national utilities and relevant government departments of Cambodia, Laos, Myanmar, Thailand, Vietnam, and the Yunnan Province of China.

Mid-Continent Area Power Pool (MAPP). MAPP was formed in 1963 as the Mid-Continent Area Power Planners. At formation, MAPPs members consisted of 21 utilities of various sizes (American and Canadian), with a range of ownership and operating structures, each of which had its own regulatory requirements and economic agenda. In 1972, MAPP began operations as a "loose pool," at which time it changed its name to the Mid-Continent Area Power Pool. MAPP has always stressed the benefits it can bring to its members through a public awareness campaign. MAPP is now reorganizing as a regional transmission organization (RTO) in compliance with US regulatory requirements.

Nordel. Nordel was formed in 1963. Nordel was a technical cooperation and advisory body with representatives from the five Nordic countries—Denmark, Finland, Iceland, Norway, Sweden—without government participation. The objective of Nordel was to; (a) monitor the development of power supply in the Nordic countries and (b) promote the best technical, economical, and environmental development through discussions and recommendations. Nordel now operates in conjunction with Nord Pool, the power market formed in 1993.[15]

Southern African Power Pool (SAPP). SAPP was established in 1995 after five years of preparation. Trade in the pool is beginning to build and should accelerate with the completion of the coordination centre for SAPP in 2001. SAPP continues to evolve from its bilateral trade origins to include pool-brokered energy sales, as well as changes in membership rules, from vertically integrated utilities to transmission-owning entities. Initial members were the utilities of Angola, Botswana, DRC, Lesotho, Malawi, Mozambique, Namibia, Republic of South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

South Eastern Europe Regional Electricity Market. The formal organization and market are under formation. In 1999, the ministers responsible for energy in six Balkan countries signed the Declaration of Intent to Establish a Regional Electricity Market in southeastern Europe. The declaration follows three years of study and preparation by the Balkan Interconnection Task Force. The declaration named the power group task force as the first interim market management committee. Due to the differences between the national systems, the regional market will develop in a phased manner. Participants are the utilities and relevant government departments of Albania, Bosnia and Herzegovina, Bulgaria, Greece, Romania, Russia, and the former Yugoslav Republic of Macedonia.

[15] Information on Nordel and Nord Pool was provided by NVE.

Table D2. International Experience of Regional Power Forum: Comparison of "Market Maker" Model

ORGANIZATION	BALTREL	GREATER MEKONG SUB-REGION	MAPP	NORDEL	SAPP	SOUTH-EAST EUROPE REGIONAL ELECTRICITY MARKET (REM)
AUSPICES	Stand alone within Baltic and Nordic States regional framework	Stand alone within GMS regional framework	Stand alone	Stand alone	Stand alone within SADC regional framework	Part of Black Sea Regional Energy Center (BSREC)
SCOPE	Electricity Trade, now includes gas	Electricity Trade	Electricity Trade	Electricity Trade	Electricity Trade	Electricity Trade
STUDY ORGANIZATION PRIOR TO FORMING IMPLEMENTATION ORGANIZATION	Yes. Baltic Interconnection Task Force Steering and advisory committees Project management team Three working groups	Yes. GMS Power Policy Forum and Experts Working Group	Yes. Policy (Utility CEOs) and Engineering Committee	No	Yes. Policy Committee and Technical Committee under SADC Electricity Sub-Comm.	Yes. Balkan Interconnection Task Force
PRIMARY OBJECTIVE OF STUDY ORGANIZATION	Development of a competitive Baltic electricity market, identify priority investments Social, macroeconics, and demand	Explore basis for power trade, identify obstacles, and recommend solution	Explore basis for power trade, identify obstacles, and recommend solutions	No	Explore basis for power trade Identify investments	Development of a competitive Balkan electricity market Identify and prioritize investments
PRIMARY OBJECTIVE OF INITIAL IMPLEMENTATION ORGANIZATION	Promote development of integrated gas and electricity market	Not applicable	Develop a detailed agreement Appoint planning committee	Technical and advisory body to promote optimal use of Nordic trans. system	Implementing body to realize benefits from increased levels of power trade	Clarify fundamental characteristics of REM and determine first steps to achieving and overseeing design of REM
TASKS/ACTIVITIES INITIAL IMPLEMENTATION ORGANIZATION	Discussion of pre-conditions for trade Study and elaboration of common rules	Not applicable	See above	Monitoring and promoting best technical and economic development	Make trade under the pool operational	Identify obstacles to market Address and identify short, med., and long-term objectives to achieve REM
INTERNAL ORGANIZATION, INITIAL IMPLEMENTATION	BALTREL committee with working groups and sub-groups (see Annex A for diagram)	Mekong energy ministers endorsed policy statement on power trade where EPF and EWG will become part of the governance structure of the market	Temporary management committee and planning committee	Advisory body, reps from five Nordic countries and sub-committees Rotating chair, responsible for secretariat	Exec. management committees, 3 sub-committees, and technical working groups	Ministers named Task Force as interim REM management committee Technical working groups

Table D2. International Experience of Regional Power Forum: Comparison of "Market Maker" Model (cont'd.)

ORGANIZATION	BALTREL	GREATER MEKONG SUB-REGION	MAPP	NORDEL	SAPP	SOUTH-EAST EUROPE REGIONAL ELECTRICITY MARKET (REM)
EXTERNAL REPORTING, INITIAL IMPLEMENTATION	Council of Baltic States Nordic Council of Ministers	GMS ministers	Complies with Nat'l and state regulations	None	SADC energy ministers	Balkan ministers of energy and BSREC
FINANCING, INITIAL IMPLEMENTATION	Donors and members	Donors, government departments, and/or utilities	Members	Members	Donors	Donors