

K&M NEWS

K&M Engineering and Consulting Corporation

MAY 2000

Energy IN AFRICA

U.S.-Africa Energy Ministers Promote Cooperative Partnership

In December, the U.S. Department of Energy hosted the first-ever "U.S.-Africa Energy Ministers Conference" with participation by energy ministers representing 48 African countries. In his welcoming remarks, U.S. Energy Secretary Bill Richardson observed, "For the first time, energy ministers from the United States and Africa are convening on a continent-wide basis to discuss Africa's energy future, and the future of the energy partnership between the U.S. and Africa."

"This conference is a cornerstone of our African Energy Initiative to foster energy cooperation and sustainable development in Africa," he said. "We now build upon the 'Blueprint for U.S.-Africa Partnership,' initiated in March 1999 at the first U.S.-Africa Ministerial."

Secretary Richardson continued, "We want to find new opportunities for cooperation in all corners of the continent. Together, we can put our words into action by identifying projects and activities, from villages to the national level, to pursue through public-private partnerships." He concluded with a call for action, "Let us work together toward fundamental change in the energy future of Africa."

K&M Senior Vice President William Drotleff offered a private sector perspective on the "Fundamentals for Successful Private Power Projects" in his remarks before the Central and Large-Scale Electricity Generation and Transmission Session. He observed, "Private power projects should, and will, be a significant part of many African countries' future energy programs."

See FUNDAMENTALS continued page 4



K&M Assisting Nigeria to Procure Emergency Power

K&M was awarded an assignment on behalf of the Federal Republic of Nigeria, Bureau for Public Enterprises, to assess sites and develop international competitive bidding instruments for the procurement of emergency power supply units. This activity, being financed through a World Bank project preparation credit, will result in the short-term provision of power generation for cities throughout Nigeria.

Nigeria's new government, led by President Obasanjo, has initiated an exciting new chapter in its development. After a 20 year period of military rule, Nigeria is embarking on an ambitious reform program designed to restore confidence in the ability of the government to provide services and improve the general welfare and safety of the population.

Privatization of state industries is high on the agenda. This includes power sector reform and promotion of independent power projects. There is a need for rehabilitation of existing power plants, upgrade of transmission facilities and demand for new generation. Installed capacity stands at nearly 6,000MW, yet an average of only 2,000MW is operational on a regular basis. Frequent outages and equipment failures plague the system.

In March, Nigeria experienced major equipment failures which resulted in back-to-back power blackouts within 72 hours and persisted for a week in Abuja, Lagos and other cities. Frustrated by a consistent pattern of outages, President Obasanjo

See NIGERIA continued page 4



K&M Selected as Lender's Engineer for "Fast Track" Power Projects in Kenya

In response to a critical power shortage in Kenya, an international consortium has received approval to develop two "fast track" 55MW diesel power projects. Deutsche Investitions und Entwicklungsgesellschaft mbH (DEG) [German Investment and Development Company] is coordinating project financing efforts in partnership with a consortium of international financial institutions. On behalf of the consortium, they have appointed K&M as the Lender's Independent Engineer.

K&M experts are reviewing contractual requirements, design and engineering, major equipment and interfaces, financial models, project costs, O&M arrangements, and construction scheduling. Gibb (East Africa Ltd.) of Nairobi is assisting in the areas of local electrical engineering interfaces and environmental issues.

Project sites are at existing Kenya Power and Lighting Company (KPLC) substations at Eldoret and Lanet, north and west of the capital of Nairobi. The projects consist of multiple heavy oil-fired diesel engine-driven electrical generators and support facilities.

K&M has prepared a Preliminary Opinion Report based on a review of the existing project documentation and a site visit accompanied by the Client and the Developers. The trip included visits to both sites, attendance at local community public meetings about the projects and several meetings with prospective fuel suppliers. A Final Assessment Report will be prepared later upon further review of the project. K&M will provide construction monitoring services during the construction period as well as review and witness the project performance testing.

See KENYA continued page 5

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Project Finance Deal of the Year Award

KMR Power's 320MW TermoCandelaria Power Project Receives "Latin America Merchant Power Deal of the Year" Award



Econopac Unit 1



Generator Installation



Line Disconnect Switch/Arrestors Bay



Unit1 Transformer Foundation



Transformer Generator Delivery



Installation Generator & Turbine

In March, the TermoCandelaria Power Project was recognized as "Latin America Merchant Power Deal of the Year" by *Project Finance* magazine at a gala ceremony in New York City. The award pays tribute to the innovative financing package structured for this project, which reached financial close in June 1999.

TermoCandelaria, now under construction in Cartagena, Colombia, represents KMR Power's largest wholly-owned project to date, doubling the company's generation base in Colombia and making it one of the country's largest generators of power.

KMR Power attracted \$175 million in debt financing for the TermoCandelaria project despite Colombia's unstable economic and political environment. With its partners, Bank of America and Centre, KMR Power arranged an innovative financing structure in which insurance was used as a surrogate for capital. The presence of a guarantee allowed Bank of America to underwrite \$40 million of the senior loan for a two-tranche bank facility. Centre, which provided a guarantee on an \$85 million subordinated loan, also took a \$35 million participation in the senior loan. Instituto de Fomento Industrial and Banco de Bogotá (Nassau) Ltd., both Colombian institutions, provided the balance of the financing.

"We are extremely proud to receive this award from *Project Finance*," said George Kappaz, CEO, KMR Power Corporation. "The TermoCandelaria project was the result of years of hard work and continued dedication to Colombia. This project clearly demonstrates KMR's commitment to serve Colombia's electricity needs."

"TermoCandelaria proves that if a project has sound fundamentals and the deal is well structured, even the most daunting obstacles can be overcome," said Stephan Marti, vice president, Centre. "We are proud to partner with KMR for this transaction and delighted to see the project honored in this way."

The TermoCandelaria Project joins KMR's two operating plants in Colombia, the 100MW Mamonal Project and the 240MW Termovalle Project. TermoCandelaria's first unit will be on-line in May 2000 with commercial operation anticipated in June. □



Turbine Unit 1 Installation



Turbine Unit 1 Installation



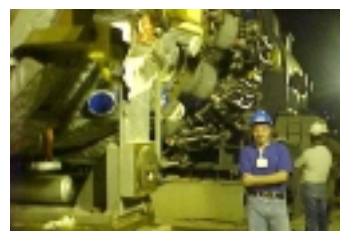
Turbine Unit 1 Installation



Turbine Unit1 Installation



Turbine Unit 1 Installation



Turbine Unit 1 Installation

Financing Water Infrastructure: “Fundamentals for Attracting Private Sector Investment”



Michael Kappaz

Facing a staggering US\$180 billion per year requirement to finance water/wastewater projects by the year 2025, government and utility officials throughout the world are increasingly turning to the private sector to meet this need.

In March, the World Water Council, an international water policy think tank, brought together leading experts and stakeholders at its Second

World Water Forum and Ministerial Conference in The Hague to discuss water-use, supply and infrastructure development issues. Two plenary sessions, major regional presentations, and over 80 break-out groups dominated the agenda. The parallel two-day Ministerial Conference, attended by 118 ministers, was designed to mobilize political support for implementing concrete action.

The Forum challenged its 3,500 participants, the largest water policy gathering in history, to move from “vision to action” to create the sustainable water world of the future. A major policy initiative prepared by the Global Water Partnership, “Towards Water Security: A Framework for Action,” was released at the forum and formed the basis for discussions. Thousands of contributors, including seven regional Technical Advisory Committees, set forth a program of action to transform current unsustainable conditions into viable programs to be implemented at the regional and local levels.

K&M chairman Michael Kappaz led a discussion on the “Fundamentals for Private Sector Investments in Water Projects” as part of the Financing Water Infrastructure session. Historically, private water projects have faced major challenges, i.e., overcoming political barriers to reform and structuring subsovereign participation/political risk. Risk allocation is more complex because of the greater number of government agencies involved and offtakers often lack the financial and operational strength to attract private investors.

However, positive trends have led to an exponential increase in the number of private water projects in recent years. During the 1990-1997 period, nearly 100 private water projects valued at US\$25 billion overshadowed a meager 8 projects worth US\$300 million undertaken in the 1980s. In 1998 alone, 380 private water projects valued at US\$74 billion were in various stages of planning funding or completion. Mr. Kappaz observed, “while not all projects in the pipeline will reach financial close, the trend shows a clear move toward greater private sector participation.”

At present, only 10% of the world’s population is provided with water/wastewater services through private operators

offering a huge market for the private sector to pursue. There are a variety of project structuring models and management options being utilized in the water sector. These range from outsourcing of selected activities through a public-private partnership, to the complete sale of assets to the private sector. (See CHART below).

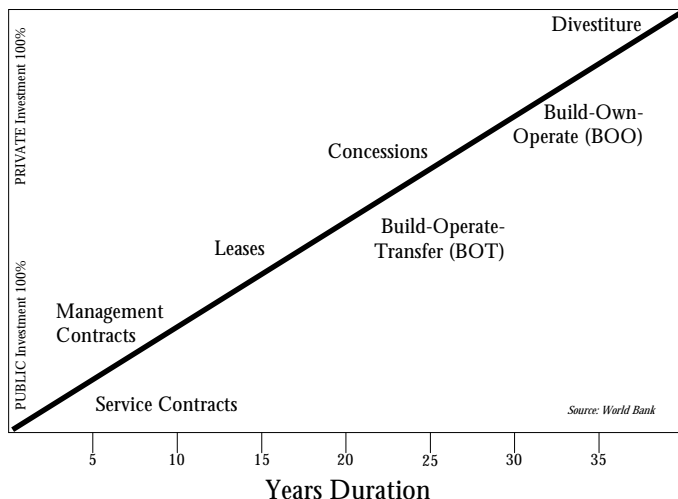
Mr. Kappaz’ presentation focused on an overview of the Build-Own-Operate/Transfer (BOO/T) financing schemes, widely used in the private power industry, now being introduced in the water sector. He offered, “BOO/T projects may be very appropriate for development of greenfield water/wastewater facilities. This structure can mobilize capital/operations for big ticket projects, it utilizes a well-known security structure that parallels independent private power projects, and allows off-balance sheet financing.” He continued, “BOO/Ts may be easier to implement when a country’s legal and regulatory framework is in transition and not yet ready for full system concessions, particularly if there is a concern over private sector control of the water utility business.” He said that the biggest drawback of the BOO/T structure is that system-wide efficiencies are not captured, observing that it makes little sense to put more water into a ‘leaky’ system.

Mr. Kappaz concluded by making a comparison to the progress of private participation in the power sector, noting that institutional and regulatory restructuring in power can facilitate private water projects. Government and utility officials are more knowledgeable in BOO/T structures and risk allocation after closing IPPs. Many of the same security structure and financing concepts are relevant and can be adapted to BOO/T water projects.

The Forum wrapped up with a number of Joint Statements and Declarations issued. The Ministerial Declaration acknowledged the pivotal role that governments play in realizing actions to meet the challenges, recognized the need for institutional, technological and financial innovations in order to move beyond “business as usual,” and resolved to rise to meet these challenges. In addition, the CEO Panel on Business and Industry issued a Statement noting the growing role the private sector is playing in the supply and management of water resources and its efforts to improve distribution efficiency. Investment by the private sector will be critical to bridging the gap between supply and demand.

The private sector welcomes initiatives for partnerships with multi-lateral financial institutions to mobilize resources, and provide guidance on structuring legal, financial and institutional frameworks. □

In the private water/wastewater sector, K&M is currently active in projects in The Philippines, Colombia and Germany. For further information contact K&M Project Manager, Loren Rodwin at K&M-Washington.



Egypt Wastewater QA/QC Awarded

In March, K&M was awarded a contract to serve as the independent Quality Control contractor to ABB Susa for the design/build expansion and modification of wastewater treatment pumping and support facilities for the City of Alexandria, Egypt. The 30-month project will be completed in partnership with local QC engineers, the Consulting Engineering Laboratories.

K&M is tasked to prepare a comprehensive Quality Control Program for implementation on this project which will provide data on the performance of the design/build contractor implementing work at the West Treatment Plant and the East Treatment Plant.

The QC team, headed by K&M Resident Manager Romeo Velasco, will regularly monitor all pertinent project product manufacturing and construction activities to assure compliance with project specifications, standards and drawings. Mr. Velasco will transfer from K&M’s nearly complete project at Port Said. K&M will provide a team consisting of a Lead QC Engineer, Lead Civil Works Inspector, Lead Mechanical Works Inspector, Lead Electrical/Controls Inspector and Testing Lab Engineer.

A Construction Risk Management Program will be established to set a baseline of existing conditions. The Scope of Work includes preliminary testing and quality control testing services to verify that control measures are adequate to provide work which conforms to contract requirements. K&M will supervise final inspection of all stages of construction.

For the past several years, K&M has provided similar QC supervisory work at the Ismailia Water Treatment Plant and Port Said Water Treatment Plant.

For further information contact Joe Shanley, K&M-Egypt. □

Council on Egyptian-American Relations Formed

This recently established "think tank" was formed to promote Egyptian-American cooperation on a broad range of issues and strengthen the bond of friendship between the two countries. Based in Washington, D.C., it is the brainchild of Egyptian Minister of Foreign Affairs Moussa. The council will host policy debates and publish papers to contribute to the U.S.-Egyptian dialogue. Recognizing that issues of major concern to both parties have become increasingly complex, the council seeks to be a forum for dispassionate and objective discussions.

K&M Senior Advisor Ibrahim Khalifa serves as a member of the Board of Directors. In late-March, in conjunction with Egyptian President Mubarak's visit to Washington, the council hosted a symposium "Egypt and Globalization." The symposium was cosponsored by the Africa and Middle Eastern Division of the U.S. Library of Congress and American Chamber of Commerce-Cairo.

As part of the session on "Globalization and the Egyptian Economy," Mr. Khalifa delivered a presentation "The Impact of Privatization on the Egyptian Economy and Egypt," which gave an overview of the current situation with regard to privatization and capital accumulation, then focused on the utility sector where K&M has had a strong presence for the past 12 years. □



K&M Senior Advisor
Ibrahim Khalifa

U.S.-Africa Energy Ministers Conference



William Drotleff

"Fundamentals for Successful Private Power Projects"

Remarks by William Drotleff, K&M Senior Vice President,
at the U.S.-Africa Energy Ministers Conference:
Panel Discussion on "Central and Large-Scale
Electricity Generation and Transmission"

INTRODUCTION

Private power projects should, and will, be a significant part of many African countries' future energy programs. However, very few countries have yet to develop private power projects as a part of a national or regional energy supply mix.

K&M recently completed a detailed survey of power needs and potential projects in most countries of Africa. Nearly, half of the projected increase in power demand in sub-Saharan Africa, estimated at 2,000MW per year can be met by private developers. Most projects will be in the size range of 50-300MW, somewhat smaller than elsewhere in the world—but that's a good factor.

Since the African market is young and most countries inexperienced, early attention to proper project structuring and development by responsible ministries is critical long before beginning negotiations with developers.

Good homework coupled with good documentation will produce lower cost projects, minimize sovereign risk, and speed development. Some of the most valuable homework includes:

- *Basic Feasibility Studies:* need for power, a reasonable forecast of the amount of power needed and annual additions, size of projects desired, location, technology, fuel, and any new transmission needs.
- *Establish Government Goals:* expected costs of power, the tariff, tariff shape, amount of market penetration by private

projects, market share limitations, if any, on a single developer, and future overall energy sector privatization or restructuring needs.

- *Type of Project:* BOO/BOT, rehabilitation, or sale of existing asset, and institutional framework changes needed to permit investment in and operation of plants by private entities.

- *Basic Risks:* those to be assumed by the government, or by the developer, or to be shared, e.g., FX, currency devaluation, fuel supply, site development, minimum power purchase obligations, force majeure, and legal.

- *Financing:* consider the type of financing which should be available to the developer (multilateral/bilateral and/or commercial), even if initially not expected to use, so as not to eliminate the option. Financing will definitely affect the cost of power. Keep in mind that the developer may use Project Finance in lieu of Balance Sheet Finance. In any regard, determine what can be done to reduce financing costs.

Financing will be necessary to cover approximately 70% of overall capital costs, and will be raised by the developer. It is one of the largest costs, so one should be aware and involved.

- *Competition:* determine the role of competition in selecting the developer. Well-conducted transparent competition brings not only lower tariffs, but can speed overall project development. It also provides a sound basis for decisions to offset any "second guessers."

Nigeria Emergency Power

(continued from cover page)

replaced the National Electric Power Authority (NEPA) with a nine-member technical committee reporting directly to him. President Obasanjo ordered the new team to provide a regular and dependable power supply by the end of 2001. A program to rehabilitate existing assets, improve maintenance and operational capacity, beef up revenue collection ability, and infuse proper management practices is being implemented.

With Africa's largest population, large industrial consumers and abundant fuel sources, it is certain that if the conditions can be created to encourage private sector development or rehabilitation of power projects, Nigeria could witness private sector investments on the order of billions of dollars over the next several years.

In the interim, the need for emergency power supplies to bridge the period before more permanent supplies can be established is critical. K&M is advising the govern-

ment on the best means of attracting and procuring private sector-provided emergency power. This will be done in the most transparent fashion. Every effort will be made to make the process open and competitive. K&M's scope of work includes preparation of the bidder shortlist, bid documents, bid evaluation, and recommendation of the successful bidder. In April, K&M finalized the Request for Proposal for the "Supply, Installation, Operation and Maintenance of 450MW of Emergency Power Units at Various Sites in Nigeria," for release by the NEPA in May.

In the months ahead, K&M will provide updates on this project, which will help alleviate the immediate power crisis while establishing the frameworks for larger scale, more permanent IPPs and possibly existing assets.

For further information contact K&M Senior Project Manager, John Rezaiyan at K&M Washington. □

U.S.-Africa Energy Ministers Conference



Holly Davis

- **Government team:** involve all ministries from the start, not just energy and industry. Secure commitments from the Minister of Finance, Minister of Justice, and/or Minister of Transportation/Mines. Get them on board before approaching the developer. Failure to present a unified front has been a major cause of project failures in a lot of countries.
- **Developer needs:** consider the goals of the developer, i.e., open, transparent environment, prompt negotiations in good faith, prompt project completion, use of proven technology, reasonable earnings, fair agreements that will stand the tests of 20-30 years, and the ability to minimize and control risks.

Successful greenfield projects using project financing are possible in Africa, if properly structured with good fundamentals, and in a country with a sound investment environment. Together with STEG in Tunisia, and BNETD in Côte d'Ivoire, K&M structured the Rades II Project and the Azito Project, respectively. They were developed and financed by experienced international developers.

In fact, Azito, a 288MW combustion-turbine project, was the first-ever project to receive a World Bank partial risk guarantee for an IDA country, and also received financing from commercial banks. Its tariff, less than \$.05/kwhr, is significantly below current costs of production in the country. Its first phase, 145MW, went into operation producing

power only three years after BNETD and K&M initiated assessment and structuring activities.

SUMMARY

- Private projects can be a significant part of Africa's future.
- Governments and their buyers need to prepare before starting negotiations with a developer (good outside advice is recommended).
- Good project structuring leads to financing.
- Balance sheet financing often is unnecessary, so more projects can be successful. □

Keynote addresses and panel discussions featured remarks by Nigeria Minister of Power and Steel Bola Ige, and South Africa Minister of Mineral and Energy Affairs Mlambo-Ngcuka. A plenary on "Financing and Investment" was led by USTDA Director Joe Grandmaison. Roundtables included discussions on "Natural Gas and Oil—Supply, Infrastructure and Markets," "Energy Technologies for Rural Economic Development," "Clean Energy and Climate Change Options," "Doing Business in Africa for Small and Medium Business," and "Presentation of USDOE's Energy Information Administration Report on Energy in Africa," (www.africaenergy.org). □

Kenya "Fast Track" Projects

(continued from cover page)

The "fast track" status will enable the international consortium to bring independent private power to Kenya with a minimum of delays, crucial to resolving Kenya's energy deficit. These "fast track" projects draw on K&M's engineering and consulting strengths gained from numerous power project assessments and successful past project development efforts. That they are being financed on a private sector basis, in Kenya, makes good the promise of foreign direct investment as a positive means for infrastructure development in East Africa.

Kenya has one of the region's fastest growing populations creating strong demand for new assets. There is 550MW new capacity in the pipeline targeted for completion by 2003. All projects are in the 55-75MW range. Access to readily available, reliable electricity is key to Kenya's progress. Its increasingly sophisticated economy, emergence as a regional banking and services

center and developing industrial base is propelling Kenya into one of the most dynamic markets in Africa.

In late 1997, the power sector was split into two authorities. The Kenya Power and Lighting Company (a publicly quoted limited-liability company with a majority share holding by the government) handles transmission and distribution, while the existing Kenya Power Company (KPC), wholly owned by the government, is the generating authority. The KPLC will enter into bulk-power purchase agreements with KPC, future independent power producers and neighboring utilities. Under the Electric Power Act of 1998, an Electricity Regulatory Board was set up to act as an independent watchdog over the electric supply companies, consumers of electricity, cogeneration, government ministries and donor agencies. Policy decisions remain in the jurisdiction of the Ministry of Energy.

For further information contact K&M Technical Director, Marty Tormey at K&M Washington. □

AFRICA ENERGY MINISTERS ISSUE JOINT STATEMENTS

At the conclusion of the conference, participating energy ministers issued two joint statements announcing agreement on 1) investment principles for the energy sector and 2) a sustained cooperative effort to integrate energy sectors to meet growing demand and spur economic growth while adhering to environmental considerations.

In the Investment Statement, they pledged to work collectively and individually to strengthen their investment environments through adoption of investment principles consistent with international practices, and to create institutional capabilities, legal structures, energy policies, regulatory frameworks and national standards necessary to attract capital and technology. The investment principles set forth are 1) create and sustain transparent, independent, and stable regulatory and legal frameworks, based on the rule of law and sanctity of contracts, 2) contribute to macro-economic policies that encourage investment in the energy sector and allow for close collaboration with international financial institutions, 3) strive for continued good governance in the energy sector, 4) work to achieve an integrated regional strategy for Africa's energy infrastructure, 5) work cooperatively with the private sector and international financial institutions, 6) promote rational use of resources, and 7) foster cooperation between public and private sectors.

In the Environmental Statement, the ministers pledged to pursue measures to enhance private sector participation and attract clean energy projects. Key targeted areas of cooperation are 1) regional energy integration, 2) rural electrification and energy supply, 3) clean energy sources and energy efficiency, 4) urban air quality, and 5) energy resource management. □

K&M AFRICA REGIONAL PRESENCE

K&M is a firsthand witness to Africa's emergence as a place for business and for large-scale private sector investment. The firm's work in the region has led to the development of several billion (US\$) in infrastructure projects.

K&M's participation in Africa's economic development is multifaceted. K&M has provided direct consulting expertise to numerous governments, multilateral institutions and private sector investors. K&M's engineers have provided owner's engineer, due diligence, quality control/assurance and construction management services on a wide range of power, telecommunication and water/wastewater projects.

In February/March 1999 K&M undertook an intensive, global review of private sector-financed power projects for the US Trade and Development Agency. As part of this study, 17 short-term (over the next 18 months) opportunities were identified in ten countries in Africa totaling more than 5,000MW valued in excess of \$3.5 billion. (*continued next page, sidebar*) . . .

Africa's Private Power Profile

BACKGROUND

K&M launches the year 2000 with an expansion of its activities in sub-Saharan Africa. Opportunities for private power developers unfold as country after country undertake major initiatives propelling a wave of restructurings, privatizations and regional cooperation, bringing the goal of economic growth closer to reality.

Sub-Saharan Africa's infrastructure needs are escalating to serve a rapidly growing population now at 600 million. At present, it has the lowest intensity of commercial energy use per capita in the world. Its 94 gigawatt generating capacity, of which 76% is thermal and 22% is hydro, accounts for a meager 3% of the world's total. (*See CHART this page.*)

Annual demand growth is expected to average 4% through 2020 with some countries greatly exceeding that figure. Natural gas demand is projected to rise annually by 5.5%, making it the region's fastest growing energy source. This expansion translates into 1,600-2,000MW per year of new capacity, primarily planned as small-to-medium scale projects in the 50-300MW range. The good news is the seeds for meeting those needs have been sown.

Power sector development requirements cover a variety of generation, transmission, and distribution projects. Last year, K&M conducted an extensive survey, on behalf of the U.S. Trade and Development Agency, of regional power projects in the near- and short-term pipeline. The results were presented at the World Power Conference, which drew wide interest by developers and funding institutions.

U.S.-Africa Initiatives

President Bill Clinton raised the region's profile by making an historic visit in early 1998, followed by dozens of trade missions at the cabinet level over the past two years. Clinton plans a return visit in mid-June 2000, with a first-ever stopover in Nigeria. In addition, the International Monetary Fund and U.S. Export-Import Bank have expanded programs. Open in only 13 countries in 1998, the Export-Import Bank now has a presence in 32 countries and is supporting \$600 million in exports to the region.

In December 1999, U.S. Secretary of Energy Bill Richardson hosted the first-ever U.S.-Africa Energy Ministers Conference attended by representatives of 48 African countries. He proposed working together to achieve fundamental change in the energy future of the region, and pledged \$1.5 million to support six projects in technical assistance and training sponsored by the U.S. Department of Energy, U.S. Agency for International Development and Overseas Private Investment Corporation. The energy ministers in turn, pledged to adopt and implement fundamental principles that address hindrances to investment and promote private participation. (*See JOINT STATEMENTS side bar, page 5.*) The U.S.-based Corporate Council for Africa, through its African Visitors Program and Trade and Investment Program, facilitated private meetings between African energy ministers and their counterparts in the U.S. Government. The ministers also met with private sector representatives interested in identifying commercial opportunities.

Other U.S. initiatives include a new program "Innovation Africa," announced in late-April 2000 by the U.S. Department of Commerce. It is designed to foster development of power, telecom, water, agriculture and health care projects funded by the private sector with support from OPIC and the U.S. Export-Import Bank. Additionally, the U.S. Congress is concluding final debate on

the "African Growth and Opportunity Act," which was stalled last fall when the House of Representatives and Senate passed two different versions of the bill.

The U.S. Government is fostering private sector development in sub-Saharan Africa through funding increases to OPIC and EX-IM programs serving businesses wishing to expand their activities in the region.

The International Monetary Fund initiated a \$700 million investment program in 1999, and set up the \$2 billion Africa Infrastructure Fund—the largest equity fund ever assembled for Africa—to support new infrastructure across the continent and promote institutional investor participation. The fund will be managed by the U.S. insurance giant, AIG, to leverage investments of up to US\$10 billion into private sector-led infrastructure projects. These programs are geared towards unbundling generation, transmission and distribution assets, setting up independent regulatory authorities which will have oversight over tariffs, and establishing financial viability of the separate entities.

Africa's Electricity

REGION	CAPACITY		
	Total GW	Hydro %	Thermal %
Central	4.3	91 %	9 %
East	2.8	64 %	34 %
North	33.0	12 %	88 %
South	43.8	15 %	81 %
West	9.6	48 %	52 %
TOTAL	93.5	22 %	76 %

Source: U.S. Department of Energy, Energy Information Administration, Energy

The African Development Bank has stepped up efforts, through its Private Sector Department, to provide US\$200-300 million per year to new projects. A newly appointed Department Director, along with a staff projected to double, will oversee a proposed 20% increase in activity, enabling the AfDB to greatly broaden its investments continent-wide. These may be modeled after the successful Azito Project, or others after the new Kenya Power Projects.

Energy Profile

Africa produces significant amounts of commercial energy and is a net exporter. The next 20 years will see a 38% increase in exports. Today, nearly 66% of production is oil, concentrated in Algeria, Angola, Egypt, Libya and Nigeria, and accounts for 88% of Africa's total oil output. Natural gas production is much smaller at 16%, with 96% concentrated in Algeria, Egypt, Libya, Nigeria and Tunisia. Coal accounts for 20%, with 96% coming from South Africa.

African oil is an important source of energy for the United States. From Nigeria alone, the U.S. purchases 40% of the country's oil exports. Africa as a whole accounts for 17% of total U.S. oil imports. In comparison, attention is often focused on imports from the Middle East, which account for 23%. Recent drastic price increases by OPEC countries provide an opportunity for Africa to strengthen its market share. By improving its infrastructure to export abundant natural resources, and open new markets to oil and gas exploration, Africa will be in a position to generate capital to spur economic growth.

In the power generation sector, sub-Saharan Africa generates 60% of its energy utilizing coal, dominated by the South Africa market, while elsewhere in the region hydroelectricity

Africa's Private Power Profile

is the primary source of energy. Hydro potential in Central and East Africa, and gas-powered facilities in West Africa, combined with government policies conducive to IPP development, make sub-Saharan Africa a very attractive market for power developers over the next 20 years.

Across the continent, individual countries are combining resources and technology to create interconnecting power grids and pipelines to share fuel resources with the help of multilateral and local public funding. As projects are initiated and implemented, host country government and utility officials gain invaluable knowledge of the complexities of a private power transaction. Pioneering projects leave a legacy of "know-how" and transparency in place empowering participants to embrace new management techniques, sector reform and procurement procedures that will attract future investments.

Infrastructure project finance has been introduced on the continent with recent financings of toll roads, water and energy projects.

c Power Sector			
NET GENERATION			
Total B K W h	Hydro%	Thermal%	
10.8	95 %	5 %	
10.4	78 %	17 %	
111.6	12 %	88 %	
217.6	7 %	87 %	
24.8	52 %	48 %	
375.2	16 %	81 %	

ergy in Africa, released December 1999 (figures shown are for 1997)

Regional Markets

Regional markets in western, southern and eastern Africa demonstrate favorable conditions for investment in private power projects. Careful examination of market conditions in individual countries reveals many opportunities to strengthen existing assets and participate in expansions. Projects abound in rehabilitations, networks, distributed energy systems, and management contracts. Returns on investment are currently generating higher returns than any region of the world.

At present, West Africa leads the way, driven by access to offshore gas and construction of the 600-mile underwater West Africa Gas Pipeline. The pipeline will connect Nigeria to Ghana and be co-owned by Benin, Togo and Ghana. The region already has an interconnecting power grid joining Ghana and Côte d'Ivoire. Other neighboring countries are making plans to connect in the near future. The West Africa Power Pool is being created to take advantage of the numerous generation facilities under construction in the region. For countries not yet in the pool—Niger, Mali, Guinea, Liberia—the intention is to bring them in shortly through BOT-structured interconnections.

Côte d'Ivoire boasts not only the first power privatization and largest IPP in the region, but the first commercially financed IPP. Indeed, the 288MW Azito project, for which K&M served as BOT consultants, was recognized as one of the most successful international projects in 1999 by the Financial Times Energy Awards, and serves as a benchmark for future projects in the region. Following a recent visit to the site, K&M Senior Vice President William Drotleff indicated that the project has an excellent operating record and is a source of pride for the

many parties involved in its implementation. Owned by the Cinergy consortium, the first gas-fired phase was inaugurated in January 1999, and the second in January 2000. It is structured to incorporate a third steam-powered turbine in the future as demand grows. New projects are currently on hold until democratic elections are held, which are scheduled for the fall of 2000.

Nigeria demonstrates potential in light of recent political reform and passage of legislation enabling the restructuring and eventual privatization of the Nigeria Electric Power Authority. Nigeria's power sector will receive a significant boost upon completion of the regional offshore pipeline, which will export large volumes of cheap and abundant natural gas to the region by 2002 and bring in revenue to upgrade generating capacity. The onshore portion will significantly contribute to improvements of in-country power facilities and delivery to major population centers. (See NIGERIA cover page).

In Ghana, KMR Power is developing the 220MW Ghana Industries Power Project, which will eventually utilize fuel from the new West Africa Gas Pipeline. Ghana plans to double its generating capacity within the next several years, with the private sector financing a majority of these projects. Historically, Ghana has relied 92% on hydroelectric power. However, new capacity will be thermal to counter shortages experienced during recent heavy droughts.

Mali, although one of the least developed countries, has experienced a growing economy and produced a 10-year track record of democracy. It has embarked on an ambitious privatization campaign. In the power sector, plans are underway to join the interconnection with Côte d'Ivoire. Mali will soon become the regional base for the U.S. Agency for International Development.

East Africa, led by Kenya, Uganda and Tanzania, is slowly emerging. Each has major restructuring and privatization exercises planned or underway that should promote investment. They have introduced IPP schemes to add needed generation capacity.

In Kenya, the focus has been on developing small- to mid-scale projects to serve solid industrial demand. Major policy change is under consideration, leading to privatization of local utilities in the near future. K&M is currently serving as Lenders Engineer for two "fast track" projects under development. (See KENYA cover page).

Uganda is restructuring its power system and will select a strategic investor at the end of 2000. AES is making a major investment in the Bujugali Power Project (US\$250M), and several other hydro projects are on the horizon.

Tanzania plans to privatize its national utility, TANESCO, in 2000 and has initiated negotiations for IPPs with interested investors.

Southern Africa, where IPPs are still a rarity, has formed the Southern Africa Power Pool with participation from five neighboring countries. The pool will coordinate grid development and greatly increase regional integration.

Prospects remain less clear in the second tier countries that remain unprepared to join in the emerging regional blocks. However, select projects have potential for development through careful adherence to project fundamentals, but under less attractive terms. Chad, Equatorial Guinea and Senegal have recently discovered substantial oil and gas deposits and are considering new IPPs. Many other countries are also trying to privatize and encourage IPPs, notably Gabon and Cameroon, but activity elsewhere is slow due to instability or high risk investment environments. □

K&M AFRICA REGIONAL PRESENCE

Recently, K&M assisted Côte d'Ivoire, Tunisia and Mauritius to develop their first independent power projects.

In Egypt, K&M has had a sustained presence for over 10 years in the power, telecommunications and water/wastewater sectors. In the power sector, K&M assisted the Egyptian Electricity Authority with policy reform, institutional development and training, as well as construction management of several large power facilities. K&M provided technical assistance to Egypt Telecom as it undertook to restructure the country's telecommunications sector, and is currently installing 1 million new lines in 12 exchanges. K&M has provided technical assistance for several water/wastewater treatment projects that have attracted private sector participation.

Elsewhere on the continent, K&M has provided technical assistance to Togo, Kenya, Zambia, Swaziland, Ghana, and Southern Africa through a variety of sector analyses, feasibility studies, and power plant rehabilitation projects. □

Structuring and Financing Projects in Today's Complex International Marketplace



A. John Rezaayan

*Excerpts from article by
K&M Senior Project Manager
A. John Rezaayan*

International power projects, particularly independent power projects (IPPs), are highly dependent on availability of financing. In addition, the power projects utilizing advanced, clean technologies must mitigate the perceived or real risks associated with the technology due to the lack of long term operating data before they can obtain financing. In today's market, project risks need to be mitigated at the source and not by an incremental increase in the owners' equity or by imposing higher lending margins. This overview addresses an approach for mitigating advanced power generation project technological risks by building into the project structure a "technology support package."

HIGHLIGHTS

Presented at the Second International Symposium on Clean Coal Technology in Beijing, China

- Why advanced power generation technology?
- Impediments to financing
- Financing methods
- Project structure
- Financing sources

Clean Coal Technology

- Higher efficiency
- Fuel flexibility
- Lower fuel cost
- Improved environmental performance
- Supports continued use of plentiful indigenous resources

Impediments to Financing

- Higher capital outlay
- Longer construction period
- Lack of long-term performance data with different fuels
- Lack of extensive experience in design, construction, operation and maintenance

Financing Methods

- On Balance Sheet
- Project Finance ✓

Conclusions

- Experienced team with determination, endurance, and problem-solving capabilities leads the project
- Project fundamentals addressed
- Risks clearly defined, mitigation strategies properly assign risks and reward project team members

INTRODUCTION

Advanced power generation technologies such as those developed under the U.S. Clean Coal Technology (CCT) program offer several advantages over existing conventional coal power generation technologies. They include:

- Higher plant efficiency.
- Fuel flexibility.
- Improved environmental performance.
- Continued utilization of plentiful indigenous resources.

However, proposed projects utilizing advanced technologies such as integrated gasification combined cycle (IGCC) continue to face difficulties in attracting financing. The main reasons are:

- Higher financial outlay requirements compared to conventional technologies.
- Lack of long-term performance data with different fuels.
- Lack of extensive experience in constructing, operating and maintaining advanced coal-fired power generation projects.

These issues, along with other project finance fundamentals, must be carefully considered. Project risks must be identified and risk mitigation strategies developed and integrated into the project structure before advanced power generation projects can achieve financial close.

In general, two different financing methods: "on balance sheet" or "project finance" (a form of "off balance sheet" financing) can be used to finance advanced power generation projects. On balance sheet financing means that whatever loans or credit raised for the project will be a direct liability/obligation of the owner and will show on the project owner's balance sheets. If the project performs poorly, or fails, the lenders can claim against other assets of the owner in the event of default on payment. In other words, owners take all or most of the projects' technical, financial, market and political risks. Historically, regulated

and state-owned utilities have relied on this type of financing. However, in today's market, because of limited public funds and competing priorities, new power projects are more likely to be financed using "off balance sheet" financing.

In "project finance" (which may be "nonrecourse" or "limited recourse"), lenders rely on the cash flows generated by the project itself for the repayment of the loan. Only project assets and contracts are pledged as collateral for the loan. Using nonrecourse project financing, lenders may not look to cash or assets outside of the project as additional collateral for the loan. In limited-recourse project financing, some predetermined amount of specific assets or cash is pledged as collateral for the project.

In project finance, careful attention is given by the lenders to structure the project so that project risks are quantified and shared properly among various parties. The sources of technical, financial, market, political and other risks are identified and allocated to the party or parties best suited and capable of reducing or mitigating them.

Both types of financing will continue to be used for new projects due to the magnitude of investment required for new power generation. Utilization of project financing for advanced technology projects will permit the successful development of major projects in the near term.

Implementing clean coal power generation technology projects supports local and regional economic development in the coal producing countries due to continued industrial activities in the indigent coal mining and other related industries. It also improves the quality of human life by improving the quality of the environment and reducing health impacts locally, nationally and internationally. Because of these social and economic benefits, the coal-producing countries as well as the international community should be expected to share some of the risks associated with the deployment of advanced coal power generation technologies with sponsors of those projects.

Project Structure

In a typical project structure the legal and contractual requirements must be satisfied and contracts must be harmonized before financial closing and disbursement of loan funds. In addition to ownership agreement, other requirements generally include:

- Firm long-term Power Purchase Agreement (PPA) or Energy Conversion Agreement (ECA).
- Long-term Fuel Supply Agreement (FSA).
- Date certain fixed-price, turnkey EPC contract.
- Guarantees, warranties or bonds for project completion and performance.
- O&M Agreement.
- Concession or Implementation Agreement.
- Assigning all contracts and insurance policies to the bank.

It should be noted that some new IPP projects are being developed as "merchant" plants—without a long-term PPA. In these cases, other means of assuring project viability are necessary.

These requirements are designed to manage many types of risks involved in a power generation project. These include: noncompletion, late completion, construction cost overruns, fuel supply, sales/offtake, technology, operating,

Advanced Clean Power Generation

environmental, country, political, foreign exchange, inflation, and other project risks.

Structuring and financing an advanced technology power generation project is similar to any other power project except lenders perceive these projects to have higher technical, operating, construction and economic risks compared to conventional technology projects. Innovative approaches must be used to address these risks. These approaches must be tailored for different technological risks. For example several ways to address these risks are: 1) Technical Support Package, 2) Financial Support Package, 3) Insurance Support Package, or 4) a combination of the above. (NOTE: *Excerpt discusses only the Technology Support Package.*)

Technology Support Package

A Project Company may require and negotiate a technology support package with various parties involved and incorporate the provision of any such support package in the turnkey construction contract, operation and maintenance agreement, waste management agreement and other contractual agreements.

Should the technology support package not mitigate new technology risks, lenders will require additional equity (more than 20 to 30%) which could make the project unfeasible from the project sponsors' view point. In addition, it should be noted that lenders' preference is to address new technology risks at their source (i.e., technology supplier) rather than asking project sponsors to support a new coal power generation technology through additional equity. Based on K&M's experience, the package may include:

- *An On-Site Spare Parts Package.* This package may include specific spare parts for the new technology portion of the plant as well as spare parts for equipment that may be damaged should the new technology fail or malfunction. The total cost of all spare parts required to be stocked by the project should be competitive with costs for a project utilizing a conventional technology. In other words, the technology supplier(s), equipment vendor(s), and EPC contractor(s) are asked to bear the risks of additional costs of the spare parts package above and beyond that required for the conventional technology.
- *An Extended EPC contract Forced Outage Warranty Provision.* The EPC contractor may provide a forced outage warranty which remains in force for an extended time period with regard to the new technology portion of the plant. In addition, the forced outage warranty may include an "evergreen" provision, which would extend the period of such warranty with respect to repairing/replacing/re-designing any equipment in the new technology portion of the plant. Furthermore, the new technology supplier, new equipment vendor(s), and/or EPC contractor(s) may be obligated to remedy any latent defects and improperly designed or fabricated components.
- *Business Interruption Provision with Respect to New Technology.* The technology supplier may bear the financial risk of any revenue loss or any additional costs resulting from delay in commercial operation, reduced availability or performance attributable to the new technology including the incremental cost of obtaining such insurance. For example, revenue losses could include foregone revenues from sale of power and additional costs could include fees associated with fuel inventory carrying costs or costs of failure to purchase specified amounts stipulated in fuel purchase agreement as well as any maintenance and repair costs.

Market Forces Drive Advanced Options

Increasingly, advanced power technology options are driven by economic and environmental safeguards. As concerns about discharges of industrial pollutants increase, the market for IGCC technologies continues to expand. The flexibility of the technology provides opportunities for waste minimization and recovery conversion of hydrocarbons to more valuable products. Gasification of low-value products and waste products in the refining industry is already commercialized. There is also a move toward gasification of black liquor for chemical recovery and cogeneration in the paper industry. The next step appears to be gasification of solid waste to minimize landfill requirements.

- *Long-term Major Maintenance and Overhaul Agreement with Technology Supplier.* Such an agreement could cover long-term major maintenance and overhaul of new technology as well as ongoing technical support. Costs for such support above and over that for a similar service involving a conventional technology could be borne by the technology supplier. This provision would:
- Minimize the risk of technology supplier escaping warranty liability by alleging improper maintenance and repair. The agreement should detail the means of allocating responsibility for poor plant performance.
- Have designated experts by new technology supplier on site during major maintenance and overhauls to ensure work is performed properly and expeditiously.
- Protect the Project Company against the risk of invalidation of insurance coverage.

Financing Sources

Structuring a project-finance package entails identifying project risks, developing risk mitigation strategies and establishing how much of the required funding for the project should be provided as equity. Project sponsors would like to minimize equity outlay while lenders would like to minimize their risks by maximum equity without causing the project sponsors to take undue risks. When a new or advanced technology is involved resources may include equity, debt, and grants. The project is also most likely to be a joint venture between private and public sector corporations.

Sources of funds play a key role in project structuring and are a major consideration. Financing sources should be carefully matched with supply, materials, and services and the impact of other factors such as local participation, and trade imbalances between the host and the country of origin of lending institutions or credit suppliers on project financing should be carefully evaluated. (NOTE: *detailed discussion on financing sources omitted.*)

Conclusions

Clean coal projects, including advanced power generation projects, can be structural and financed provided project fundamentals are addressed, risks are clearly defined, and mitigating strategies developed. In addition, a key ingredient to successful project finance and implementation is determination, endurance, and problem-solving capabilities by project sponsor and advisors. K&M has demonstrated the importance of adhering to sound principles of project finance through its many pioneering IPP projects across the globe. While conditions may vary from country to country, or project to project, the fundamentals remain constant. □

K&M/KMR IN THE NEWS

COLOMBIA

KMR's Mamonal Project
Cartagena, Cover Photo
Private Power Executive
October 1999

KMR's TermoCandelaria
Project, Cartagena
"Deal of the Year Americas
Category: Latin American
Merchant" *Project Finance*
February 2000

EGYPT

Power: Special Report
K&M Engineering
Middle East Economic Digest,
February 2000

GENERAL

*Privatisation International
Millennium Yearbook*—
Egypt Privatization chapter
contributed by K&M
financial analyst Dominique
Masse, released January 2000

*Privatisation International
Millennium Yearbook*—
Utility Regulation in Latin
America. Colombia Electric-
ity and Gas Markets Update
contributed by KMR vice
president-project develop-
ment Ralph Fairbanks and
KMR gas market consultant
Benjamin Schlesinger,
released Winter 2000

"Old-Fashioned Power"
KMR Power
Washingtonian Magazine
January 2000

WASHINGTON BUSINESS JOURNAL

November

TOP 25

ENGINEERING
FIRMS IN WDC
—K&M Engineering—

66

#21

CATHOLIC CHARITIES

K&M/KMR were corporate sponsors of the Gala 2000 Catholic Charities Ball, "Faith Works Wonders." The February gala was chaired by Doug and Mary Donatelli and cohosted by the Year 2000 Society.

The gala netted over \$330,000. K&M's William Kappaz is active in the Year 2000 Society, which performs community service and fund-raising throughout the year.

U.S.-Colombia Business Partnership

K&M Chairman Michael Kappaz was recently elected Chairman of the Board of Directors for the U.S.-Colombia Business Partnership. Founded in 1996, the Partnership promotes trade and investment opportunities between the two countries. A variety of American energy, pharmaceutical and machinery companies represent nearly US\$8 billion in investments in Colombia. K&M Engineering is one of the founding members of the Partnership. KMR Power is also a member.

The Partnership was formed by companies concerned that the strained relationship between the United States and Colombia over the narcotics issue risked overshadowing important existing and future business opportunities for U.S. firms.

During the past several months, the Partnership has advocated for approval of the Supplementary Assistance Package for Colombia under consideration by the U.S. Congress. The Assistance Package seeks to promote economic growth, increase political stability, reinforce investor confidence, and fund human rights training programs. □



Left to right: Chairman Emeritus, Michael Skol; Colombian Ambassador to the United States Luis Alberto Moreno and K&M Chairman Michael Kappaz.

Speakers Bureau

K&M/KMR executives participated in a variety of trade missions, conferences, seminar roundtables, power delegation briefings, meetings and presentations. This offers opportunities to exchange ideas and share important experiences with counterparts, project developers and government officials throughout the world.

MARCH

Michael Kappaz, speaker
World Water Forum, Panel: Financial Aspects of Water Infrastructure Projects
Topic: "Fundamentals for Private Sector Investment in Water Projects"
Sponsor: World Water Council
The Hague, The Netherlands

Ibrahim Khalifa, speaker
Egypt and Globalization Symposium
Topic: "The Impact of Privatization on the Egyptian Economy and Egypt"
Sponsor: Council on Egyptian-American Relations
Washington, DC, USA

FEBRUARY

Michael Kappaz, speaker
Corporate and Project Finance Solutions in a Changing Market: Examining Innovative Financing Strategies for Sponsor/Developers Seeking Acquisitions, JVs and Equity Investment Opportunities
Topic: "Understanding How Governments Are Changing Their Approach to Privatisation, Deregulation and Bid Evaluation in Light of the Crises of Recent Times"
Sponsor: Projects International, International Centre for Business Information
Paris, France

JANUARY

Michael Kappaz, speaker
Gulf and North Africa Project Finance and Privatization
Topic: "Innovative Financial Strategies in Infrastructure Projects and How to Lower the Cost of Capital in Project Finance"
Sponsor: U.S. Department of Commerce, Abu Dhabi Chamber of Commerce and Industry
Abu Dhabi, Dubai

George Kappaz, speaker
Latin American Energy Summit
Topic: "The TermoCandelaria Project: A Study in Innovative Project Finance"
Sponsor: Economist Conferences
Houston, Texas, USA

DECEMBER

William Drotleff, speaker
U.S.-Africa Energy Ministers Conference
Topic: "Fundamentals for Successful Private Power Projects"
Sponsor: U.S. Department of Energy
Tucson, Arizona, USA

George Kappaz, speaker
International Power Forum
Private Power in Emerging Markets: a Merchant Future?
Topic: "Structuring and Developing Private Power Projects in Emerging Markets"
Sponsor: Hagler Bailly
Washington, DC, USA

K&M-Egypt: Five Year Awards

K&M Chairman/CEO Michael Kappaz (third from left) presents five-year awards to K&M-Egypt employees at annual Christmas holiday dinner-dance.



1. HATEM OMAR
Admin. Assistant/Driver
2. DOAA SAMY BADR
Administrative Secretary
4. ADEL ABD EL MONEIM
Logistics Specialist
5. METWALLI HASSAN
Driver
6. SAMEH EL GIZERY
Lead OSP Engineer

Meet Our Manager

K&M Senior Project Manager John Rezaiyan is a Chemical Engineer who specializes in advanced power systems and environmental improvement technologies. He conducts feasibility studies and risk evaluations, technical, economic and market assessments, designs financial models, and organizes technology exchange tours. In addition, he is an expert in electricity sector restructuring and unbundling strategies.

Since joining K&M in 1993, Mr. Rezaiyan has been integrally involved in a number of K&M's key projects. He is currently leading the company's newest project in Nigeria on behalf of the World Bank, assisting the government to provide emergency power generation and to formulate a strategy for privatization of the energy sector. In March, he traveled to Lagos, Sapele, Ughelli, Port Harcourt and Aba to assess the suitability of potential sites for emergency power projects in Nigeria.

Many *K&M News* readers know Mr. Rezaiyan through corroboration on an extensive series of technical support projects undertaken on behalf of the U.S. Department of Energy, National Energy Technology Laboratory (formerly known as the Federal Energy Technology Center and Morgantown Energy Technology Center).

Mr. Rezaiyan has led K&M's DOE project team performing 43 assignments consisting of a variety of feasibility studies, market assessments and commercialization strategies for a series of advanced power systems and clean coal technologies. In addition, he has performed technical assessments of several environmental hazard mitigation technologies that reached patented stage.

A sample of these advanced technologies include: Circulating Air Barrier, Cone Grouting Barrier System, Circulating Fluidized Bed, Integrated Gasification Combined-Cycle, Horizontal Air Drilling, Pulsed Gasifier, Exhaust-Fired Combined-Cycle, and Municipal Solid Waste to Energy. He has investigated potential commercial application of several first-of-their-kind Clean Coal Technologies, such as Advanced Coke Production to convert coal to coke in an more environmentally acceptable manner and in continuous process for applications in the steel industry.

In conjunction with the DOE/NETL program and USAID, Mr. Rezaiyan conducted a feasibility study on behalf of a



John Rezaiyan

Senior Project Manager

"John personifies what K&M is all about . . . outstanding technical credentials coupled with impeccable financial and project management qualifications."

*Michael Kappaz
Chairman/CEO*

EXPERTISE

Clean Coal Energy Technology Assessment

Environmental Risk Assessment

Technical and Economic Assessment

Process Design, Development & Demonstration

Fuel Conversion & Plant Life Extension

Privatization Strategies

private utility in India seeking to introduce the Integrated Gasification Combined Cycle (IGCC) technology utilizing indigenous coal.

In Ecuador, Mr. Rezaiyan managed K&M's Electricity Sector Restructuring Project on behalf of the country's modernization council (CONAM). K&M assisted the government and utility officials to restructure the power sector, unbundle generation, distribution and transmission assets, design a new commercial and regulatory framework, assess financial viability of new business units, and propose strategies for implementing the privatization legislation. This effort culminated recently with the transfer of assets to the newly formed electricity authority and valuation of viable assets for sale to private sector investors.

Mr. Rezaiyan has conducted numerous due diligence evaluations of first-of-a-kind power projects and technologies on behalf of investment banks and commercial firms. These evaluations included technical and financial viability assessments, key project agreement reviews, raw material availability and product marketability and valuation. In addition, he has monitored construction progress, start-up and commercial performance, project costs, and operation of power plants on behalf of project lenders.

Prior to joining K&M, Mr. Rezaiyan was the founder and president of Columbia Engineering and Technology Group. Earlier he served as a project manager for Science Applications International and Sheladia Associates, and as a lead engineer for Hydrocarbon Research.

He is a frequent speaker at international industry symposiums and has written numerous articles on advanced power generation with a recent focus on "Structuring and Financing Advanced, Clean Power Generation Projects in Today's Complex International Market Place" and "Structuring and Financing Clean Coal Technologies."

Mr. Rezaiyan completed graduate work in Business Management (Finance) at the University of Baltimore and holds a B.S. in Chemical Engineering from the University of Maryland.

He originally hails from Tehran, Iran and speaks fluent Farsi. He currently resides in Columbia, Maryland with his two daughters. □

EMPLOYEES: Our Most Valued Asset

K&M ENGINEERING

NEW HIRES —

Prem Babu
Chief Electrical Engineer

David Kandahari
Accounts Payable Clerk

Patty Kappaz
Marketing Analyst

Krishna Khan
Computer Network Administrator

Ross J. Pfile
Business Development Associate

KMR POWER

NEW HIRES —

Candis MacDonald
Executive Assistant to the President and CEO

5 YEAR AWARDS

WASHINGTON—K&M

Surendra Daulat
Worth Edwards
Leonid Golbin
Martin Tormey
Cindy Shepard
Henry Steingass

WASHINGTON—KMR

Steve Johnson
Ann Mayfield
Wanjiku Njuguna

CAIRO—K&M

Doaa Samy Badr
Sameh El Gizery
Adel Abd El Moneim
Metwalli Hassan
Hateem Omar

(See PHOTO page 10)

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Fax: (011) 575-668-6664

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Fax: (011) 202-365-4346/7

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