Appendix: Experience Detail

Manzar Naeem Qureshi

B.Sc Electrical Engineering/M.Sc. Electrical Engineering
Power/Energy Sector Management, Energy Market, Corporate, Regulatory, Planning, Specialist

Mr Qureshi has over 25 years of professional experience of Pakistan's energy sector that includes over 17 years of working as a management consultant in leading roles. The detail of Mr Qureshi's professional experience by employer is attached hereunder.

I. E2 Consulting, Islamabad, Pakistan: June 2016-Present

Mr Qureshi is the Chief Executive officer of E2 CONSULTING aiming to provide energy and environment management consultancy services to its client. In his capacity as a power and energy sector specialist, he has dealt with a wide range of technical, commercial, economic and financial management services. Key projects managed and supervised by him include:

- Mari Petroleum Company Limited (MPCL), one of the largest petroleum exploration and production companies in Pakistan, was working on developing a gas-fired combined cycle gas turbine (CCGT) power project as an IPP1 on Build, Own, and Operate (BOO) basis to be located near Dharki (Sindh) or Sadiqabad (Punjab) in Pakistan. The project was planned to be fueled with low calorific value gas (about 460-480 BTU2/SCF) to be supplied from MPCL's Lower Goru B Reservoir. Mr Qureshi carried out the independent review and technical evaluation of four bids received for owner's engineer services to carryout project's pre-feasibility study, feasibility study, project development up to financial close, design review and project management services and construction management, supervision and warranty period services. Mari Petroleum Company Limited (MPCL), Pakistan, 2017.
- NTDC is presently conducting System Impact Assessment (SIA) for evacuation of power from various hydroelectric power projects (HPP) along the Indus River in the Kohistan Area of Khyber Pakhtunkhwa (5400 MW Dasu HPP, 496 MW Lower Spatgah, 665 MW Lower Palas Valley, 2300 MW Patan and 4000 MW Thakot) on Indus River a total cumulative capacity of 12861 MW. Transmission lines for power evacuation from Dasu and other HPPs had severe corridor constraints prompting detailed techno-economic comparison for selection of the optimal option. The three options considered for implementation included 500 KV and 765 KV HVAC and 500 KV HVDC. Mr Qureshi carried out the economic comparison of the options and prepared ranking criteria for selection of options based on a matrix of various key factors contributing critically in the construction and operations of the transmission lines and grid stations in the project area for National Transmission and Despatch Company (NTDC), Pakistan, 2017.
- In order to improve Pakistan's power transmission infrastructure and management, Asian Development Bank (ADB) funded projects worth US$ 900 million under a multi tranche financing facility (MFF), the Power Transmission Enhancement Investment Program II for the National Transmission and Despatch Company (NTDC). The physical investments aimed at increasing high-voltage transmission capacity to meet growing demand, improve

[1] Independent Power Producer
[2] British Thermal Unit

transmission efficiency and energy security, and evacuate additional sources of power through the rehabilitation, augmentation and expansion of transmission lines, substations and supporting infrastructure. Nonphysical investments focused on increasing the financial management, regulatory relations and procurement capacity of the transmission system of NTDC. The nonphysical investments also catered to increase in institutional efficiency, cost recovery, competition, transparency and good governance within the sector. Mr Qureshi provided power sector overview, financial management assessment of the Executing Agency (NTDC), feasibility study and the economic and financial analysis of the sub-projects and contributed relevant sections of the ADB RRP report for National Transmission and Despatch Company (NTDC), Pakistan, 2017.

II. Parsons International Limited, Doha, Qatar: August 2014-June 2016

Mr Manzar Naeem Qureshi is Principal Engineer/Project Manager, in the Parsons Environment & Infrastructure (PE&I) Division. He was responsible to manage the projects and business development for the newly formed oil and gas practice of the company in Qatar. Mr Qureshi managed and contributed to the following key Oil and Gas sector projects:

- Contributed as the project QA/QC specialist in the core team for construction supervision and engineer's representative on a QR 900 million infrastructure development project 'Refurbishing & Upgrading Works for Various Pumping Stations - Phase 6, 7 & 8'. In addition, supervised and monitored project closeout activities for contractors and Ashghal (executing agency). Public Works Authority, Qatar, 2015-16
- Under the International Convention for the Prevention of Pollution from Ships, also known as MARPOL 73/78, Qatar is planning to implement adequate reception facilities for Annex-I (oil) wastes generated from ships arriving at ports. Qatar Petroleum, the government's designated agency to implement the MARPOL project, has engaged PARSONS to develop a Front-End-Engineering Design (FEED) for this facility that will, in turn, be implemented through an Engineering- Procurement-Installation and Commissioning (EPIC) contract. Mr Qureshi managed a multidisciplinary team of engineers and other support staff working on the MARPOL project. While managing the project activities, his roles included coordinating between various project discipline leads, interfaces and stakeholders; monitoring of project execution plan and ensuring timely completion of all activities; interaction with QP management team on project deliverables and associated problem resolutions, preparing progress reports and follow-up on the QP comments and directions on project submittals. Qatar Petroleum, Qatar, 2014
- As proposal manager, Parsons, managed preparation and submission of a number of project proposals and bids for oil and gas sector projects to various public and private sector clients. Parsons, 2014-2015.

III. Hagler Bailly Pakistan, Islamabad: October 2003- August 2014

Mr Manzar Naeem Qureshi was Divisional Manager, Energy Programs at Hagler Bailly overseeing the power, oil and gas, and renewable energy practice of the company. As head of the energy division, he advised government, IFIs, multilateral and bilateral donor agencies, and corporate clients both from public and private sector by helping them in decisions making processes regarding policies, reforms, governance, regulatory, institutional reorganization and capacity building, investment and business development options, long term strategic and business planning, economic and financial assessment, and project feasibility analysis. Mr Qureshi supervised and contributed in the following key power and energy sector projects:

- Mr Qureshi supervised an independent evaluation of the Load Data Improvement (LDI) Project funded by the United States Agency for International Development (USAID) under the five-year long $230 million Pakistan Power Distribution program. The LDI project entailed the installation of automatic meter reading (AMR) devices on all 132 kV and 11 kV power lines in the country to monitor, in near-real time, load and power quality data on all distribution feeders to improve the management of power dispatch, network dynamics, power quality, service delivery, and reduce the incidence of forced outages. Mr Qureshj provided a comprehensive quantitative and qualitative technical, financial and economic assessment of the direct and indirect benefits accruing from the LDI facility on electricity supply to end consumers, utility operations and financial performance, power sector reform process, and the national economy. The significance and role that LDI-enabled actions could play in improving power sector policies, management, planning and investment decisions were also identified. The report was presented by USAID to the Ministry of Water and Power, Government of Pakistan as well as the US Congress. International Resources Group (IRG), Pakistan and United States Agency for International Development (USAID), Islamabad, 2014.
- The Government of Pakistan, with technical and financial assistance from the Asian Development Bank (ADB) under its Pakistan Power Distribution Enhancement Investment Program (PDEIP) multitranche financing facility (MFF), undertook to implement Advanced Metering Infrastructure (AMI) in two distribution companies (DISCOs) serving the Lahore and Islamabad service territories, respectively to improve the financial viability and reliability of the power distribution system in Pakistan. The proposed investment program's objective was to introduce AMI and gradually expand it to cover all DISCOs in Pakistan, as a necessary precursor to implementing smart grids in the country. Mr Qureshi carried out economic and financial due diligence and prepared PC-I document for government's approvals. The project's aims included reducing distribution losses and improving system performance metrics and revenue collection, improving load control and network management, automated recording of consumption data and demand profiles, and modernizing the existing electricity metering and billing system. **Project financing was approved and implementation is now underway at both LESCO and IESCO.** Asian Development Bank, Manila, 2014.
- Mr Qureshi supervised a study on the integration of liquefied natural gas (LNG) imports into the natural gas transmission networks of Sui Southern Gas Company Limited (SSGCL) and Sui Northern Gas Pipelines Limited (SNGPL). The study consisted of a hydraulic analysis of the SSGCL and SNGPL gas transmission networks and assessed the need for network augmentation. Mr Qureshi prepared estimates for capital costs for necessary transmission systems augmentation to absorb 800 to 1,000 MMSCFD of regasified LNG injected into the gas network at Port Qasim, Karachi. Finally, the study evaluated alternatives for maintaining the Wobbe Index in line with natural gas network operating specifications. The Associated Group, 2014.
- In association with Tetra Tech Inc. of USA, Mr Qureshi led a three-day training workshop on Utility Regulations for Saudi Aramco. Saudi Aramco the state-owned oil company of the Kingdom of Saudi Arabia, is a fully integrated, global petroleum and chemicals enterprise and has emerged a world leader in hydrocarbons exploration, production, refining, distribution, shipping and marketing. The workshop was attended by 24 officials from different management disciplines of the Company. The workshop aimed at introducing the power sector reforms and focused on developing understanding of the objectives, scope and implementation procedures of electricity regulations in the newly established regulatory regime through setting Electricity and Cogeneration Regulatory Authority (ACRA) by the

Kingdom. Mr Qureshi delivered presentation on policies, strategies, and operations, institutional structure of power sector; traditional utility structures; role of regulator; basics of utility regulation; power market models; tariff-setting principles and methodology; transmission use of service charge regulations. Saudi Aramco, Kingdom of Saudi Aranbia, 2013.

- On the request of government of Pakistan, USAID funded a study through Advanced Engineering Associates International (AEAI), USA, to develop an integrated power sector financial model (PowerSim) to analyzing the intended effects of various policy reform options and to enable government to formulate policies that are quickly implementable; have high-impact, and bring positive benefits to power sector, government and consumers of electricity in Pakistan. The analytical model was designed to provide an assessment to: 1) quantify benefits of potential actions and corrective measures; 2) provide for multiple scenario forecasting; 3) allow comparative assessment of policy options; 4) provide indicators of tangible positive impacts on the energy sector, the economy, and on society; 5) provide inputs for other modeling tools; and 6) provide clear results for use by policy reform decision makers to eliminate the long standing power sector deficits and resulting circular debt that was estimated to reach the level of US Dollar 6 billion by end of FY2013. Advanced Engineering Associates International (AEAI), Inc., 2013.
- TNB Liberty Power Limited (TNB LPL), an independent power producer (IPP) owns and operates a gas fired 235 MW combined cycle thermal power generation plant set up under the 1994 Power Policy in Pakistan. TNB Liberty Power has been incurring substantial financial losses on account of a mismatch in indexation of fuel prices specified in its Gas Sales Agreement (GSA) with SNGPL and Power Purchase Agreement (PPA) with WAPDA Private Power Organization (WPPO) since its commissioning. Mr Qureshi carried out an independent audit of TNB Liberty Power Limited to identify and resolve issues relating to mismatch between GSA and PPA fuel prices. The audit evaluated the financial impact of fuel price mismatch (FPM) on the annual profits of TNB LPL, identified options for removal of FPM, assess the impacts of removal of FPM on various stakeholders due to variations in gas prices or power purchase price and recommended an optimum option based on financial, legal and regulatory considerations. The Report was presented to Ministries of Water and Power, Petroleum and Natural Resources, Private Power and Infrastructure Board, and WPPO for resolution of the FPM related issues. **The issue was resolved in the light of recommendation made in the audit report.** TNB Liberty Power Limited, 2013.
- The ADB was the lead financier to raise debt of nearly US$ 2 billion for the new 2x600 MW coal fired units at Jamshoro Power Company Limited (JPCL) to be developed with total capital investment of UD$2.7 billion. Mr Qureshi worked out the power purchase price for the power purchaser, 'Central Power Purchasing Agency', for the new 2x600 MW coal fired units at JPCL in line with NEPRA guidelines and tariff determination procedures for coal fired plants in the country. Mr Qureshi also carried out the economic and financial analysis of the coal fired project and financial management assessment of the project's executing agency (JPCL) for the purpose of approval of financing from the ADB Board of Directors and for the PC-I of the project for government approvals. **The project's PC-I and financing are now approved and the project is under implementation.** Asian Development Bank, Manila, 2013.
- The ADB carried out an Energy Sector Assessment for Pakistan as part of the due diligence for the Pakistan Power Sector Rehabilitation Project (PSRP). The scope of services included a review of existing sector studies; identifying and filling in gaps in available information; analyzing government sector development policies, strategies, regulations, and investment plans; assessing energy markets and economics; diagnosing key sector development issues;

and proposing strategy and action guidelines for initiating sustainable, long-term development of the country's energy sector. The analysis was based on recommendations contained in the Friends of Democratic Pakistan's Energy Task Force Report and the Energy Efficiency Road Map developed under the ADB's Pakistan Energy Efficiency Investment Program multi-tranche financing facility (MFF). As part of the assessment, Mr Qureshi contributed to the state of energy sector including a situation review analysis, government policies and status of power sector reforms, governance and financial management issues confronting the sector, and outlining the impact of IMF conditionalities on performance of power sector. Asian Development Bank, Manila, 2012-13.

- Under a technical assistance grant to the Government of Pakistan, the World Bank hired the consortium of Tetra Tech, Inc. and Hagler Bailly Pakistan to conduct a prefeasibility study to examine options for the import of 500 MW of electricity to the Lahore region in Pakistan by setting up a transmission interconnection between Pakistan and India's power systems. The study aimed to assess the preliminary feasibility of available technical options and to identify strategic issues and/or important risks associated with the proposed interconnection and electricity trade. Mr Qureshi carried out the key tasks of the study that include: the supply demand assessment of the two countries for the projected exportable surplus on Indian side and power shortages on Pakistan side to determine the optimum electricity trade volume between the two countries; identification of technical options that include HVDC Back-to-Back for asynchronous operation of the two grids; selection of two best ranked options based on economic, financial, commercial and environmental assessments; review of power market structure and legal framework for electricity trading between the two countries; review of trading models in the region and design of a suitable trading model for India-Pakistan electricity trade. The World Bank Permanent Mission, Islamabad, 2012-2013.
- The Pakistan Commissioner for Indus Waters (PCIW) filed an arbitration case at the Court of Arbitration constituted in accordance with the Indus Waters Treaty 1960 by the International Court of Arbitration at Hague, the Netherlands, against the construction of 330 MW Kishenganga Hydroelectric Project (KHEP) by India on Kishenganga/Neelum river in Indian-administered Kashmir. Pakistan filed the case on the premise that (1) India’s construction of KHEP will place a resource essential to Pakistan’s existence under the control of India and the integrity of the Indus Water Treaty regime will be undermined, and (2) the timing, volume and location of deliveries of water into Pakistan from tributaries of the Indus are certain to be affected by KEHP, leading to substantial adverse impacts upon Pakistan’s Neelum-Jhelum Hydroelectric Project (N-JHEP) which is under construction at Nauseri, downstream of the KHEP. Mr Qureshi calculated the economic impact of the projected reduction in energy generation from the under-construction N-JHEP resulting from the water diverted by KHEP on the cost of generation and increase in electricity tariff for consumers in Pakistan. The impact assessment was carried out through a detailed dispatch analysis of the generation system in Pakistan and took in to account the seasonality of electricity demand, hydroelectric and thermal plant capabilities, thermal efficiencies, plant availability, and prices of alternative fuel resources. Mr Qureshi attended the arbitration hearings at the International Court of Arbitration, Hague, the Netherlands, from August 16-27, 2012 to assist the PCIW team during the hearings. The Pakistan Commissioner for Indus Waters, 2012.
- Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan have been pursuing the development of electricity trading arrangements and the establishment of a Central Asia-South Asia Regional Electricity Market (CASAREM). The proposed cross border transmission line project will be a dedicated link essentially aimed at supplying surplus power of around 1000-1300 MW from the Kyrgyz Republic and Tajikistan to Pakistan via Afghanistan. The CASA-1000 Project is estimated to cost $1 billion and consist of 750 Km

long 500 kV HVDC and HVAC Transmission lines and 500 kV AC/DC and DC/AC converter/inverter stations. Under the USAID South Asia Regional Initiative for Energy (USAID Sari/Energy) provided technical assistance to Government of Pakistan to help GoP negotiate the project parameters and agreements with other participating countries and stakeholders. As the commercial advisor and member of Pakistan Working Group, Mr Qureshi is providing advice on energy import prices that include transmission charges, transit fees and power purchase price, project structure, delivery point(s), and project agreements for the cross border energy transaction. He participated in the Joint Country Working Group (JCWP) Meetings held in Dushanbe in November 2011, Almaty in January and April 2012, and Dubai in May 2021 as well as monthly JCWG meetings held through video conference from Pakistan until September 2012 in connection with preparatory activities for CASA-1000 Project. In earlier phases, the assignment included review and preparation of comments on the Project's feasibility study for the; the project structure agreement term sheets including Concession Agreement Termsheet, Power Purchase Agreement Termsheet, Facilities Lease Termsheet, Transmission Services Agreement Termsheet, and Account Bank Agreement Termsheet; IFC Infraventure Joint Development Agreement; project risk matrix; review of project cost estimates and transmission tariff; prepared comments and briefing papers and reports for MoWP, attended CASA-1000 meetings, provided coordination services with other team members and Pakistan counterparts, and capacity building of counterpart entities. **The project agreements are now signed and project is fast moving towards implementation phase**. Tetra Tech Inc. USA (USAID SARI/Energy), 2009-12.

- On the request of government of Pakistan, USAID funded a study through Advanced Engineering Associates International (AEAI), USA, to assess the financial and economic value of natural gas for specific sectors of the Pakistani economy. Major objectives of the study were to optimally allocate and price this important and increasingly scarce fuel without unnecessarily compromising the country's economic development identify and prioritize sectors where gas supplies could generate the highest economic returns for the country. Mr Qureshi lead an assessment of the financial and economic value of natural gas in the power, industrial, fertilizer and transport sectors and contributed in assessment of the same in the residential and commercial sectors. The study helped the Government in formulating policies to help manage existing gas shortages and provided bases for a review of the existing gas allocation policy, and for rationalizing the prices of gas through prudent fiscal and management measures. Advanced Engineering Associates International (AEAI), Inc., 2010-2011

- Advanced Engineering Associates International (AEAI), Inc., carried out technical performance and energy audits of power plants operated by Pakistan's state-owned generating companies (GENCOs) to assess the present operating conditions and efficiencies of the generation units. The plants included the 850 MW Jamshoro, 1,655 MW Guddu, and 1,350 MW Muzaffargarh thermal power stations in central Pakistan. Mr Qureshi supervised the study, which included onsite measurements of plant operating parameters at different load factors as well as laboratory analysis of the heavy fuel oil used, to determine baseline conditions and establish existing performance benchmarks for evaluating actual efficiency gains and operational improvements achieved after the subsequent implementation of a planned GENCO Repair and Maintenance Plan to be funded under Fixed Amount Reimbursement Agreements (FARAs) by the United States Agency for International Development (USAID) for the Government of Pakistan. The audit study assessed current output capabilities, heat rates, and thermal efficiencies, and annual availability or plant factor of each power station's generation units. The report also highlighted major causes of performance deterioration at these plants and assessed the potential for using high-viscosity

fuel oil to reduce the plants' generation costs. Advanced Engineering Associates International (AEAI), Inc., 2010-2011

- The ADB conducted a third-party audit of the underlying basis and prudency of procurement terms and procedures for rental power plants (RPPs) being considered to meet short-term power generation deficits on Pakistan's national grid on the request of GoP. As senior energy sector specialist, Mr Qureshi was engaged by the ADB to carry out the requisite study and was responsible for the analysis and preparation of the ADB report, to evaluate and recommend options for increasing power supply in the short-term (18 months), including rental power and rehabilitation of existing power plants, to assist the government in its short-term power sector planning. The report reviewed the short-term demand and supply gap, power plant utilization and affordability of customers through increase in customer tariffs under various supply options and power demand growth scenarios. The study also reviewed the modalities and procedures followed in the procurement and contracting of rental power plants in terms of financial prudence, transparency, and compliance with relevant international best practice. Asian Development Bank Manila, 2009-10
- In early 2009, the Government of Pakistan initiated anti-insurgency operations in parts of militancy-affected areas of Federally Administered Tribal Areas (FATA) and Khyber-Pakhtunkhwa (KP) province in the northwest of the country. This resulted in significant internal migration of communities from the embattled areas. The government formally requested its development partners, i.e., the World Bank, the Asian Development Bank (ADB), the United Nations (UN), and European Union (EU), to initiate and lead a 'Post Crisis Needs Assessment (PCNA) of KP and FATA' to help turn the tide in the conflict zone and build upon initial humanitarian and recovery assistance to develop sustainable long-term development and peace in the region. As senior energy sector specialist, Mr Qureshi carried out the detailed PCNA study of the areas' energy requirements. The PCNA included assessment of energy needs, infrastructure, and related income generation and employment opportunities in the short term (6 month), medium term (30 month) and long term (8-10 years). The assessment focused mainly on electricity and natural gas, carrying out due diligence on on-going development plans of energy utilities to determine their adequacy and gaps with respect to energy service levels in the rest of the country. The study also evaluated potential supply options for rural electrification and supply of electricity to remote locations through small-scale renewable energy, such as mini and micro hydro plants and solar photovoltaic systems, to relieve pressure on the national grid. THe study report comprised the energy section of the final PCNA study presented to the Government of Pakistan by the ADB and World Bank. Asian Development Bank Manila, 2010
- As deputy team leader of the consulting consortium led by Mercados EMI of Spain, worked on the establishment and commencement of the Central Power Purchasing agency (CPPA), and formulated the recommendation for the distribution of functions and institutional structure for the various functions involved in the trading and settlement of electricity, including the role of the CPPA and the National Transmission and Dispatch Company (NTDC) and other related entities. The responsibilities also include assessment of financial flows between the power sector entities, revision and finalization of commercial code and standard agreements with the market participants, preparation of trading sector procedures, suggestions for organizational structure and operational guidelines, and initial training to the CPPA staff on trading sector procedures. As deputy team leader, was also responsible for coordination with government and other stakeholders. **The proposed independent CPPA is now fully functional since 2015**. Asian Development Bank, Manila, 2007-08
- Supervised a Least Cost Generation Expansion Plan for the power sector for the World Bank, Pakistan Resident Mission. The study included the long term assessment of the energy supply

and demand balance in the country for electricity, natural gas, petroleum and coal sectors under different scenario options of generation capacity additions, fuel availability and constraints, energy prices, energy imports, and climate change options. The options and scenarios were compared on the bases of NPV, LRMC, and carbon emissions for each case to select the least cost solution for the country. Study also analyzed the impacts of energy bill on the balance of payments and power sector investment to GDP ratio under the alternative scenarios. The World Bank, Pakistan Resident Mission, 2009.

- Under the ADB TA for preparation of Pakistan's Sustainable Energy Efficiency Development (SEED) Program participated in preparation of a comprehensive national program for mainstreaming energy efficiency in all sectors of Pakistan's rapidly growing economy in order to help the nation reduce its energy deficit and improve competitiveness in the global marketplace. He made major contributions in designing of a baseline domestic lighting survey of a total of 3,250 households across the eight Ex-WAPDA DISCOs and KESC to gauge consumer awareness for CFLs and general electricity consumption habits in the country. The survey design was compatible with the CDM Methodology AMS II – J that is designed for similar CFL distribution programs. In addition, contributed to development of CFL distribution program and associated costs for the 8 DISCOs and the technical, economic and financial impact analysis for consumers, DISCOs, government and other stakeholders. Assisted in preparation of procurement specifications. Also supervised preparation PC-I for CFL procurement and distribution by the DISCOs for approval from government. Also prepared subprojects on power plant replacement options for GENCOs, compressor replacement and installation of power generation at decompression facilities and replacement and upgradation program for domestic gas appliances in accordance with ADB standards and guidelines to be financed under the SEED Investment Program under a proposed ADB Multitranche Financing Facility. As part of the Report and Recommendations of the President (RRP) conducted the financial and management assessment of PEPCO, KESC and other implementation agencies. Asian Development Bank, Manila, 2008-2009
- Under a Technical Assistance of the ADB, provided technical support to Sarhad Hydro Development Organization (SHYDO) in evaluation of technical and financial bids received for appointment of the Management Consultants of the three hydro power projects (Daral Khawar-36.6 MW, Renolia-11.5 MW and Machai-2.6 MW) and the SHYDO Office Building in accordance with ADB guidelines and procedures for bids evaluation. The projects were financed under the ADB's multitranche financing facility (MFF) to finance the Renewable Energy Sector Development Investment Program (REDSIP) tranche I. Asian Development Bank, Manila, 2008
- Under a Technical Assistance of the ADB, prepared the ADB project appraisal documents for 36 MW Shigarthang, Skardu and 4 MW Thach, Chilas hydroelectric power projects for approval of financing under the tranche II of the ADB's REDSIP multitranche financing facility. The projects are being executed by the Northern Areas Water and Power Development Department (NAWPD). The appraisal documents were prepared in accordance with the ADB guidelines and standards and included: (i) a financial management assessment for the executing agency (NAWPD); (ii) the detailed cost estimates (using ADB format) for each project; (iii) a summary financial analysis of each project; and (iv) a summary economic analysis of each project. Asian Development Bank, Manila, 2008.
- Star Hydro Power Ltd (SHP) planned to develop the 150 MW Patrind Hydropower Project, a run-of-the-river hydroelectric plant on Kunhar River in Azad Jammu Kashmir. Environmental Resource Management Korea (ERM) was contracted by Star Hydro Power to provide advisory services for financing of the project under the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change

(UNFCCC). Acted as the local focal person for ERM, provided consulting services to ERM and SHP in this regard, including project site evaluation, compilation of relevant power generation data, and assistance in determination of national baseline greenhouse gas emissions, as well as conducted meetings with the Designated National Authority (DNA) and stakeholders' for consultations, as required by CDM. ERM Korea Co. Ltd, 2010.

- Under a Technical Assistance of the ADB's Carbon Market Initiative (CMI), helped ADB assess concepts, emissions baselines, financial viability, additionality, and technical soundness of Clean Development Mechanism (CDM)-eligible projects in Pakistan. The TA was designed to build a pipeline of clean energy projects eligible for the CDM and Bank financing and to enhance corresponding technical capacity of project developers and sponsors in the host countries. The scope included screening of potential clean energy projects from the Bank's Pakistan portfolio and assess their CDM potential; prepare a CDM Assessment Reports (CARs); identify and develop appropriate greenhouse gas (GHG) baseline evaluation and monitoring methodologies; prepare Project Design Documents (PDDs) and other application requirements for submission to the CDM Executive Board, including project concept notes for potential certified emissions reduction (CER) buyers; provide support during the CDM validation process; liaise with relevant government agencies to secure host country approval; and assist in capacity building, as required, of project developers. Asian Development Bank, Manila, 2007-2008.
- Under the Technical Assistance of the ADB helped obtain carbon financing from the Clean Development Mechanism (CDM) under the ADB's Pakistan Renewable Energy Development (RED) Project, which initially consisted of several small hydro schemes in the Punjab and Northwest Frontier provinces identified during ADB's earlier project preparatory technical assistance to the country. Tasks including the identification and development of an appropriate greenhouse gas (GHG) baseline evaluation and monitoring methodology, preparation of a Project Design Document (PDD) and other application requirements for submission to the CDM Executive Board, including a project concept note for potential certified emissions reduction (CER) buyers, support during the CDM validation process, liaising with relevant government agencies to secure host country approval, and capacity building assistance, as required, to the project developers. Asian Development Bank, 2006-2008.
- Supervised a study to develop a long-term assessment of the energy supply and demand balance in the country focusing on identification of areas in which investment opportunities are likely to emerge in the medium term. The study involved updating of the long term energy demand and supply forecasts prepared earlier by HBP to account for changes in energy prices, outlook on economic growth, and revisions in power utility plans for installation of power generation capacity. The study took in to considerations the alternative resource development and demand management scenarios and power plant dispatch to assess the energy generation and fuel consumption by power plants, and power shortages resulting from utility plans. Impacts on the balance of payments of the country on account of energy imports under alternative scenarios were evaluated. Specific opportunities for investments in the power sector to meet the energy requirements of the country were identified and prioritized. DHA Cogen Limited, 2008
- Conducted a comparative assessment of long-term fuel options for a 362 MW combined cycle power plant for PIE-AMPower Company at Punjab Industrial Estate, Sundar. Options considered included natural gas, high sulfur fuel oil, low sulfur fuel oil, and high speed diesel, which were evaluated on the basis of the delivered prices of fuel, fuel availability, associated infrastructure requirements, and implications of each fuel option on the plant's capital, operational, and environmental costs in order to select the most economical alternative fuel to

natural gas. The study analyzed total generation costs for each alternative option and for combinations of natural gas and alternative fuels to recommend the most economical combination for firing the plant, and formed the basis for subsequent tariff negotiations with the regulator based on the selected primary and secondary fuels. AM Power Company Ltd., Lahore, 2008.

- Provided operational support to the office of the Energy Advisor to the Prime Minister, Government of Pakistan under an ADB Technical Assistance. The responsibilities include the formulation and implementation of a medium to long term strategy for Pakistan energy sector. Major tasks undertaken were review of electricity and gas demand and supply analysis conducted by utilities, availability of gas to various sectors of economy, energy sector policy analysis, and coordination with government and other power and energy sector stakeholders for Asian Development Bank, Manila during 2005-2007.
- Conducted a market due diligence study prior to the ownership transaction of the 157 MW Fauji Kabirwala Power Plant set up as an independent power producer (IPP) in Pakistan. The study assessed the electricity sector and power industry structure, electricity demand growth, IPP country experience, relevant legal, regulatory and governance aspects, financial viability of local IPPs, and other issues related to IPP operations and asset management. PA Consulting Government Services, 2007
- Updated the feasibility study for a 14 MW hydel project located at Jing in the AJK. The study focused on the update of the cost estimates for the project, revising the tariff for electricity generation and filing for a Letter of Support (LoS) with the AJK government for Sambu Construction Company, Islamabad, 2007
- Carried out a preliminary viability assessment of a 224 MW combined-cycle gas turbine (CCGT) power project, proposed by Engro Chemical Pakistan and fueled by permeate gas from the Qadirpur gas field operated by the Oil and Gas Development Corporation (OGDC), in central Pakistan. The Scope included the review of the project proposal with respect to marketability of generated power, technology and site selection, availability and cost of fuel, tariffs offered by power purchasers, and the necessary regulatory consents for Premier-Kufpec Pakistan. 2006
- Carried out a power market study to assess the competitive position of the 134 MW Saba Power Company (Pvt.) Ltd. within the Pakistani electricity system in view of the projected power demand and dispatch of its power plant. The study paid special attention to the commercial aspects of the company's existing tariff with the Water and Power Development Authority (WAPDA) under the company's long-term Power Purchase Agreement with WAPDA for the ABN Amro Bank, Netherlands, 2005
- Conducted a scoping study for Tethyan Copper Company–an Australian mining firm focused on exploring the gold and copper deposits at Saindak and Reko Diq in Pakistan's Balochistan province– for a captive power plant at their copper extraction site. The assignment included a review of the small plants operating in Pakistan along with their capital and operating cost benchmarks. In addition, it involved an assessment of the options available for supplying power to the client's site from the local power utility, including an assessment of both price and reliability. Additionally, the possibility of importing power from nearby Iran via the existing transmission network was also evaluated. Tethyan Copper Company, 2005
- As part of a consortium led by the Economic Consulting Associates of UK, worked on Institutional Capacity Building of National Transmission and Dispatch Company to facilitate the establishment of a competitive power market in the country. The aim of the project was to review the Government's energy sector policy for power sector restructuring, power system

developments, and the functions of the National Transmission and Dispatch Company Limited (NTDC) as per its licence of 31 December 2002, and assist NTDC to fulfill its licence requirements. As local partner in the consortium, he was also responsible for coordination with government and other stakeholders. Asian Development Bank, Manila 2004.

- Conducted Ex-post economic and financial evaluation of the 1,450 MW Ghazi Barotha Hydropower Project (GBHP) on the basis of the actual costs and construction schedule to see whether the investment in the Project as built was consistent with the least-cost generation expansion plan for the WAPDA system and to assess the economic viability of the stand-alone project in terms of economic and financial rates of return and cost-benefit ratio for the World Bank, 2004
- Conducted a brief multi-fuel competitiveness study to evaluate the least-cost power generation options in Pakistan to assess the relative competitiveness of various power generation technology options based on size, technology, fuel, location, and other generic operating characteristics for Engro Chemicals Pakistan Limited, 2004
- In association with Norplan, carried out a performance review of the Northern Area Public Works Department's Hydro Electric Workshop and made recommendations to enhance the overall efficiency and effectiveness of the workshop's operation for the Royal Norwegian Embassy, Islamabad, 2004
- Filed a Review Motion with NEPRA in respect of Small Power Producer's (SPPs) Tariff determination made by NEPRA on behalf of 10 SPPs, 2004.
- Provided consulting support for the submission and processing of the distribution license applications to NEPRA for the distribution facilities of Genertech Pakistan Limited, 2004.
- Supervised the technical and economic analysis of a study to evaluate and recommend measures for the safe transportation of newly discovered crude oil from Tall Block in Pakistan's Northwest Frontier Province (NWFP) to Attock Refinery Limited in Rawalpindi. The study included due diligence on the in-house reviews of short- and long-term safety measures considered by MOL, and assessed possible methods for the transportation of oil, prepared cost estimates for the construction of a new bridge en route at Khushalgarh, and conducted economic and risk analysis of the fuel transportation options studied. MOL Pakistan Oil and Gas Company, BV, 2007-08.
- As part of a PricewaterhouseCoopers led consortium, provided financial advisory services for a large pipeline project for gas supply to the country from Iran. Services included assessment of long-term country demand for natural gas under alternative economic growth scenarios, a range of prices for imported gas, and varying international market price forecasts for crude oil and coal. A sectoral analysis based on elasticity of demand with respect to income and energy prices was carried out, within the constraints of national energy priorities and security considerations for PricewaterhouseCoopers LLP, London, UK. 2005.
- Carried out an economic evaluation of the proposed multi-billion dollar 2000 MMscfd Iran-Pakistan natural gas pipeline. The study took into consideration the investments required for the pipeline and evaluated potential savings resulting from replacement of alternative fuel options for Pakistan for Interstate Gas Systems Limited. 2007.
- In a consulting consortium led by Energy Solutions International, UK, developed a system optimization strategy for the existing gas transmission infrastructure of SNGPL with a focus on improving flow patterns and capacity of existing infrastructure for the transport of gas from fields to demand centers, and reduction of operating costs associated with gas

transmission operation. The study included identification of deficiencies in the existing system, and technical and economic analysis of alternative configurations for operation and expansion of the transmission system. Sui Northern Gas Pipeline Limited, 2007-2008.

- Principally conducted a study of current trends in the midstream and downstream oil and gas sector in terms of demand, supply, infrastructure, financial health, and emerging trends in market fundamentals in Pakistan that also included feedback from the industry on the implementation of regulatory regime as well as recommendations to improve the efficiency of the oil and gas industry for the Oil and Gas Regulatory Authority (OGRA), 2004.
- Carried out a study to review the current oil and gas producer pricing structure in Pakistan and recommend appropriate revisions in the pricing formulae for present and future oil and gas production. Prepared the model to undertake the quantitative and economic analyses of the recommended revisions, and their financial impact to all the stakeholders, ie, the government, the production industry, and the consumers for Oil and Gas Development Company Limited (OGDCL), Pakistan, 2005.
- Conducted a study involving a detailed analysis of the capacities of the Sui Northern Gas Pipelines Limited (SNGPL) and the Sui Southern Gas Company (SSGC) transmission networks for the year 2011, taking into consideration the gas demand supply projections, current transmission expansion plans, potential gas imports through LNG and cross country pipelines. The study also included an update on the natural gas demand and supply situation in Pakistan with special emphasis to the demand of gas in power sector that required power demand and supply analysis. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. OMV (Pakistan) Exploration GmbH, Islamabad, 2005.
- Supervised the study for the commercialization of natural gas and oil/condensate supplies from for the development of the offshore Indus Block M project in Pakistan. The main tasks included supply and demand analysis for gas and condensate in the country, natural gas infrastructure hydraulic analysis to ascertain infrastructure requirements for transport of gas, identification of tie-in points for injection of gas in the national gas network, marketing options for condensate, movement of oil and condensate to respective markets, and site selection for gas/oil/condensate processing facilities. Eni Pakistan Limited, 2010.
- Carried out a detailed study for the market assessment of gas, liquefied petroleum gas (LPG) and condensate in Pakistan for the Mehar Oil and Gas Field Development Project. The services included supply and demand analysis for gas and condensate, petroleum products, infrastructure requirements for supply of gas and other petroleum products from the Mehar Block to respective markets, gas quality analysis at critical points in the gas delivery system, marketing and transport options for condensate. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. Petronas Carigali Pakistan, 2007.
- Participated in a technical and commercial due diligence, for acquisition purposes, of a Pakistan-based LPG marketing and distribution company. The scope of the assessment included a commercial evaluation of company's operational assets, LPG supply contracts and quotas, distribution agreements, and inventory and environmental management practices. On

the technical side, the due diligence involved evaluation of associated LPG facilities, expansion potential for increased LPG handling, company cost and market pricing structures, and safety and quality assurance procedures used by the company. JS Private Equity, 2007

- Prepared the gas price projections for the period 2007-2015 and negotiation strategy with the Government of Pakistan for a 1.2 MT steel plant located in the Bin Qasim Industrial Area near Karachi. Al-Tuwairqi Steel Mills Limited (TSML), 2007.
- Prepared price forecasts of electricity, natural gas, fuel oil and high-speed diesel (HSD) for large industrial consumers for the period 2007-2020 to help in evaluation of options for a captive power generation facility to be installed at its industrial facility of a large petrochemical facility located in the Bin Qasim Industrial Area near Karachi. In the assessment, natural gas and electricity prices were worked out under different crude oil price scenarios and took into consideration basic commodity prices, transmission and distribution costs, duties, taxes, and other applicable market markups. Pakistan PTA Private Limited, 2007
- Participated in a joint study with BHP Billiton Petroleum to review the status of the IPI and investigate the prospects of the proposed project in the light of prevailing international political and economic climate. The study specifically looked at the positions of various stake holders adopted over the course of IPI project and emerging options for each of them with respect to the project and its alternatives. BHP Billiton Petroleum, Australia, 2006
- Provided assistance in preparation of SOQ for the Hub Power Company Limited (HUBCO)– a prospective bidder for the Sui Southern Gas Company Limited (SSGC)– for submission to the Privatization Commission for prequalification purposes. Hub Power Company Limited, 2006
- Carried out a detailed study to assess natural gas supply, demand, and pricing patterns in the context of proposed imports of gas at a delivery point in southern Pakistan. Prepared the model to analyze the natural gas supply and demand situation and impact of LNG and imports through trans-country pipeline to bridge the demand supply gap for the country in general and the Karachi market in particular. The analysis also included the impact of imported gas on consumer gas prices and the market value-chain for gas and alternative fuels. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. British Petroleum (BP) Pakistan Exploration and Production, Inc., 2005
- Provided assistance to the Private Power Infrastructure Board (PPIB—GoP's one-window operation for setting up the new IPPs) in estimating appropriate commitment charges and their detailed application for dedicating gas supplies for proposed power plants while linking the commitment of gas supplies to the foreclosure of the projects. 2005
- Prepared a market update for natural gas sales in the country, including the SSGC and SNGPL utilities, with special emphasis on the commercialization of 200 MMscfd of newly discovered gas in the SSGC system. Long-term gas surplus and shortfall in the country for the period FY2004 to FY2020 was assessed, as well as short-term developments in the SSGC and SNGPL gas markets during FY2005-FY2007. The market situation was analyzed by taking into account the existing commercial obligations of various fields for the supply of gas to the utilities. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power

sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. BP Pakistan Exploration & Production. 2004

- Assisted in a study for formulating a development strategy with private sector involvement in developing Pakistan's natural gas infrastructure. Scope included to conduct long-term gas demand and supply analysis and prepare an infrastructure development plan, including hydraulic analyses of the transmission network, a techno-economic evaluation of the options considered—including the need for strategic gas storage for meeting seasonal demand peaks—and a framework for private sector participation in the development plan for the World Bank. 2003 (support role).
- Carried out a comparative analysis to help the government of Pakistan in the assessment and ranking of the gas import options from three sources on the basis of a uniform and objective criteria, and in developing a negotiation strategy for selection of the most viable and economic option or options for the Ministry of Petroleum and Natural Resources, 2004
- Prepared an excel-based Offshore Production Sharing Model under the rules and regulations outlined in the Petroleum Exploration and Production Policy-2001 for ENI Pakistan, 2004.
- Carried out a detailed gas market analysis for commercialization of 150 Mmscfd additional Zamzama Gas to evaluate the gas supply-demand balance in the SNGPL, SSGC, and independent systems over the FY2004-2020 period. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. Premier-Kufpec Pakistan BV, 2004.
- Carried out a detailed gas market analysis for commercialization of 200 Mmscfd Badin II Gas to evaluate the gas supply-demand balance in the SNGPL, SSGC, and independent systems over the FY2004-2020 period. The study included the assessment of long term electricity demand forecast, assessment of generation expansion plan under the unconstrained gas availability for power sector and based on realistic hydro and coal based generation capacity development, power plant dispatch analysis under economic dispatch criteria, plant-wise fuel consumption, and total fuel consumption of power sector. BP Pakistan Exploration & Production Inc, 2004.

IV. Enerman Group of Companies, Islamabad: 1998-2003

Enerman (Pvt.) Limited,
Integrated Solutions Services (Pvt) Limited,
Enerman Group Advisory Services)

As Managing Partner and Director, Mr Qureshi managed and supervised numerous projects in both the electric power and natural gas sectors. He was extensively involved in the regulatory process of both the power and gas sectors and has represented industrial consumers through tariff petitions, intervention in tariff hearings and representation before the power and gas regulatory authorities' licensing process as well as made representations on hearings on rules and regulations. He has also undertaken a large number of assignments on policy advice to public and private sector clients in the areas of power and gas demand forecasting, generation planning, utility tariffs, power system planning, design and engineering, project economic and financial assessment, integrated resource planning, privatization, restructuring and utility regulation in the power and energy sector. Some of the key projects that Mr Qureshi supervised included:

- Ministry of Water and Power and WAPDA Working Group: Primarily responsible for the development of a complete disaggregated financial model of the WAPDA Power Wing operations, broken into one National Transmission and Dispatch Company (NTDC), eight distribution companies, and three generation companies, to assess the financial implications of the Restructuring Plan of WAPDA Power Wing.
- WAPDA Distribution System Reliability: Carried out an extensive study to work out the reliability of the WAPDA distribution system and developed procedures to determine the reliability indices from basis operational units to overall WAPDA distribution system level, as part of his thesis for his master's degree in electrical engineering. M.Sc. Thesis *"Reliability Assessment of Power Distribution System in Pakistan"*, 2001
- Consulting services to HUBCO during Generation License Hearings: Provided consulting support to the Hub Power Company to protect the interests of the Hub Power Company Limited (HUBCO) during the processing of generation license applications by National Electric Power Regulatory Authority. Hub Power Company 2003
- Consulting services to AES Lalpir & AES PakGen Pakistan: Provided consulting support to AES Lalpir and AES Pak Gen to protect the interests of AES Lalpir and AES Pak Gen during the processing of generation license applications by National Electric Power Regulatory Authority. He participated in a conference held by NEPRA to determine the terms and conditions of the National Transmission and Dispatch Company's (NTDC) license and the rights and obligations of the NTDC in the new restructured regime. AES Pakistan Limited, 2003.
- Consulting services to SPPs for Distribution License: Provided consulting support to four small power producers (SPPs)—Sitara Energy Limited, Sapphire Power Generation Limited, Gulistan Power Generation Limited and Genertech Pakistan Limited—for the submission and processing of their distribution license applications to NEPRA.
- Consulting services to Private Electric Power Producers' Association (proposed) and SPPs: Provided consulting support to the proposed Private Electric Power Producers' Association and 21 individual SPPs in Karachi to protect their interest in Pakistan's new regulatory regime being implemented by NEPRA. This included the preparation, submission, and follow-up of generation license applications as well as representing SPP interests in distribution company license hearings. Private Electric Power Producers' Association, 2000-2003
- Commercialization of Wind Power Potential in Pakistan: Contributed his expertise to conduct a GEF-funded feasibility study to install a 15-MW wind power station at Pasni. Mr Qureshi led the study on financing structure and tariff design for sale to WAPDA in order for the project to be developed by the private sector. His responsibilities included regional power demand and supply analysis and forecasts in Pasni and adjoining areas, a power demand analysis, development of a plant dispatch mechanism among all the power generation facilities in the area in the context of wind power generation and alternative comparison, and an assessment of another allied power infrastructure development plan.
- Power plant expansion and dispatch model: Developed a power plant expansion and dispatch model to estimate the projected gas demand of power plants by working out the capacity additions required to meet the projected demand and plant scheduling for energy generation, along with fuel requirements of thermal power plants on a monthly basis. Enerman Group
- Integrated energy model: Developed an integrated energy model to estimate the projected demand for gas and petroleum products, substitution trend, total energy demand of the

country and to assess the import of energy after accounting for indigenous supply of different energy products. Enerman Group

- Provided consulting service to the Nagori Dairy and Cattle Farms Association in the Nagori Area (Karachi) for change of tariff category for the dairy and cattle farms from commercial to agricultural tariff in the KESC (presently K-electric) franchised region: Provided technical, financial, and regulatory services in establishing the justification for change in customer category.
- Consulting services to Pakistan PTA Limited for a Tariff Petition: Provided technical, financial, and regulatory services in developing a cost of service-based tariff petition for Pakistan PTA Limited.
- Support to ICI Pakistan for tariff petition: Prepared, represented, and coordinated ICI Pakistan's 220-kV-based tariff petition and rebate petition for its PTA business filed at NEPRA, based on the cost of service methodology. He developed a cost-of-service model to determine differences in cost between a 220 kV connections and 132-kV service connection in the KESC system. The tariff petition was decided by NEPRA in favor of ICI Pakistan by constituting B5 tariff category in the KESC for consumers connected at 220 kV.
- Interventions on behalf of organizations at NEPRA rate-case hearings: Prepared and presented interventions on behalf of the All Pakistan Textile Mills Association, Overseas Investors, Chamber of Commerce and Industry, at the NEPRA rate case hearing of WAPDA and KESC petitions in 2002. The presentation analyzed the operational and investment efficiencies of the power utilities and their conformity to regulatory standards prescribed by NEPRA.
- Interventions on behalf of ICI at hearing of SNGPL petitions, 2002: Prepared and presented interventions on behalf of ICI Pakistan Limited at the OGRA rate case hearing of SNGPL petitions in 2002. The presentation analyzed the operational and investment efficiencies of the gas utilities and government take from gas revenue.
- Electricity Consumption Survey for Textile Industry: Carried out an industrial survey in collaboration with All Pakistan Textile Mills Association to determine the electricity consumption behavior of the textile industry in Pakistan.
- Pakistan Energy Outlook: As Energy Analyst, Prepared sections of the Enerman Group's subscription-based publication relating to demand and supply of all energy products, including power, gas, fuel oil, and other petroleum products, and financial viability of energy utilities
- Gas Fuel Oil Substitution: Worked with Premier and Shell Pakistan BV to analyze gas-fuel oil substitution possibilities and competitive fuel and stranded assets analysis
- Financial models of WAPDA and KESC: Developed financial models to analyze the financial viability of power utilities under the tariffs options, investment plan, fuel prices, and excess inter-company debt between power utilities and other state-owned enterprises (fuel suppliers).
- Financial analysis of state-owned enterprises in Pakistan: Developed financial models of the SNGPL, the SSGCL, PSO, and other energy utilities as part of and exercise for former Union Texas Pakistan (now BP Pakistan Exploration & Production Inc.) and to analyze the impact of excess inter-company debt between state-owned enterprises in Pakistan. The study also included an analysis of Pakistan's ability to pay to foreign E&P companies by assessing its trade balance and GDP growth.

- Integrated Energy Demand and Supply Model: Developed a demand- supply projection model covering petroleum products and refining capacity as well as other energy sources in Pakistan, accounting for substitution trends and supply constraints to assess the long term growth and trends in the demand and supply of energy products in Pakistan's energy market.
- Energy Resource Development Study for Premier Kufpec Pakistan Limited: Led a study to estimate the size and timing of the development of new gas-fired generation facilities in the country based on Enerman power demand forecasts, and other alternative resource development assumptions. Mr Qureshi also analyzed power and gas infrastructure requirements for the optimal location of the new combined-cycle power plants.
- Dumbar Marketing Study for Premier Kufpec Pakistan (Pvt.) Limited Pakistan: Led a study to assess the generation capacity additions during the 2003-2010 period potentially on natural gas fuel, demarcate locations for power plants in Sindh and Punjab, analyze their interconnection options with the national grid vs. pipeline options at various locations, in relation to the establishment of a 600-MW combined-cycle power house in order to utilize gas from the Dumbar gas field in Sindh.
- Pre-feasibility Study of a 600 Km long, 500 MMSCFD Gas Pipeline from Dadu to Multan for Premier-Shell Pakistan (BV): Worked on and coordinated a pre-feasibility study of a 500 MMCFD capacity, 600 Km long Gas pipeline from Dadu (Sindh) to Multan to supply gas to 5 major power plants in the Multan region. The responsibilities included assessment of gas demand of power plants, gas-fuel oil substitution possibilities and competitive fuel and stranded assets analysis
- Strategic Review of E&P Business Plan, for Premier-Shell Pakistan (BV): Worked on the strategic review designed for optimal development of 7 producing Assets in Pakistan. The analysis included preparation of gas demand forecast for power and other categories, infrastructure analysis, financial analysis of SSGC & SNGPL to test their ability to pay and ability to invest in the system to absorb newly discovered gas.
- Gas Commercialization Study, Pakistan, for Petronas Carigali Pakistan: The assignment included detailed gas demand -supply and infrastructure analysis, gas value chain, and sales option available for the commercialization of gas to be produced from Mubarak Gas Field
- Initial Environmental Examination (IEE) of a thermal power plant: Led an environmental examination of the thermal power plant. The study involved the analysis of liquid effluents, solid waste disposal—including oil sludge and waste lube oil—air emissions, noise, and the safety and health conditions of workers.

V. Assistant Program Manager, Motorola Pakistan, 1998

At Motorola, Mr Qureshi was responsible for the preparation and implementation of purchase orders placed by Motorola's clients in Pakistan. He was also responsible for various periodic progress reports for the senior management.

VI. Assistant Director, Planning (Power), WAPDA, 1991-1998

Mr Qureshi worked as Assistant Director, in the Planning (Power), Department of the Water and Power Development Authority (WAPDA). He was trained as an economist and financial analyst during the preparation of the National Power Plan project (NPP), funded by the Canadian International Development Agency (CIDA) and executed jointly by M/s Acres International of Canada and the Planning Department of WAPDA. His responsibilities as the principal WAPDA counterpart to the CIDA team included economic and financial analysis of alternative generation and transmission expansion plans and their impact on utility tariffs, cost analysis for hydroelectric

and thermal generation and transmission projects, load forecasting, generation and transmission expansion planning, and recommendations on demand-side management. Mr Qureshi also worked on an NPP team to conduct a market survey to determine the cost of energy not served (outage cost) for different categories of WAPDA consumers.

In his seven-year tenure at WAPDA, Mr Qureshi also worked on a series of major assignments, including;

- Privatization plan for a power distribution company (FESCO) in Pakistan: Mr Qureshi was primarily responsible for developing a financial model to determine distribution charge and sale proceeds of the distribution company. The assignment also included technical assessment of assets for investment requirements and potential efficiency gains in utility operations expected to result from privatization.
- National Power Plan Project (NPPP 1992-94): Principal WAPDA Counterpart Economic and Financial Analysis - He worked in the NPPP team to conduct a market survey to determine cost of energy not served (outage cost) for different categories of WAPDA consumers. Also worked on project screening analysis for least cost development plan and alternative scenarios of generation expansion plans. He assisted the consulting team in performing the analysis in areas of hydro project costing, thermal plant costing, hydro projects: layout, quantities and cost review, power planning economic and financial analysis, creation and maintenance of data base-NPPP, data base documentation and transfer, demand side management methods and designs, load forecasting methods and design.
- National Power Plan Update Project (1994-96): Principally responsible for financial analysis of hydro & thermal projects including cost estimation, power planning, project economic and financial analysis and impacts of different alternatives and assumptions on utility tariffs, utility financial projections, preparation of the update of Economic and Financial Analysis Reports in the FY1995 and FY1996.
- Thermal Power Plant Feasibility Studies (1994-96): Principally responsible for thermal project cost estimates and economic & financial analysis of the six power plants at different sites. Also worked on determination of power purchase tariff for WAPDA from these power plants for base load and peaking conditions if installed in Private Sector.
- 1992 Power Sector Restructuring Plan: Mr Qureshi was part of the WAPDA Working Group formed to study and prepare the comments on this Plan under which the WAPDA power wing was dissolved into 11 independent companies.
- Pakistan's 9th Five Year Development Plan's section pertaining to power sector: As part of WAPDA team, worked on an assignment that included demand forecasts, a generation expansion plan, a paper on demand side management and projections of fuel requirements for thermal power plants.
- Studied and estimated the power demand in the far-flung areas of Balochistan, including those, which are yet to be connected to the national grid. This assignment was carried out in response to a query raised in parliament.
- KAPCO Environmental Impact Assessment Study: Prepared input module to the dispersion model used to simulate gaseous plume for KAPCO. The input module function was to transform the five-year historic meteorological conditions into dispersion model specific input combinations.
- Economic Evaluation and Tariff Analysis of Malakand-III Hydropower Project: A case study to assess the relative economic viability of Malakand-III hydropower project under the two

scenarios of development by public or private sectors. The study compared the relative price for sale of electricity generated from power plant to WAPDA under the two development options and prepared recommendations thereon.

In addition to specific projects, Mr Qureshi worked on a large number of studies on techno-economic issues related to energy policies, independent power producers (IPPs), private hydroelectric generation and transmission projects, transmission and distribution losses, fuel use in thermal power stations, thermal emission models for environmental impact assessments of thermal plants and restructuring and privatization options for the power sector.