

## **Mr. Zia Haq, U. S. Department of Energy**

Mr. Haq is a senior analyst with the U.S. Department of Energy, Office of the Biomass Program (OBP). He manages the analytical activities conducted by OBP. Prior to this position, he worked as an operations research analyst at the Energy Information Administration (EIA). He has worked for various energy consulting organizations and at Southern Company Services. He was a senior engineer in a coal gasification demonstration power plant, and has over 20 years of experience in energy and environmental areas. Mr. Haq has a Bachelor of Science degree in Chemical Engineering from Northwestern University and a Master of Science in Chemical Engineering from the Johns Hopkins University.

Current projects in the land use area that DOE is funding are listed below. Mr. Haq is the technical monitor of these projects:

- Oak Ridge National Laboratory - Developing a framework for a global land use change model
- Argonne National Laboratory - GREET model development to incorporate additional biofuels and pathways
- Purdue University via a subcontract with Argonne National Laboratory - Developing the GTAP model to incorporate cellulosic ethanol feedstocks and their land use impacts
- National Renewable Energy Laboratory - Developing the Biomass Scenario Model via a subcontract with John Sheehan at University of Minnesota to incorporate global land use change scenarios
- Pacific Northwest National Laboratory and Joint Global Change Research Institute at the University of Maryland - Enhancing the capabilities of the MiniCam model to incorporate global land use change impacts

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### **SUMMARY OF EXPERIENCE**

Mr. Haq is a Senior Analyst at the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. The Office is involved in the research, development, and deployment of lignocellulosic-based biofuels. He is responsible for all studies, reports, model development activities, forecasts, and cost targets developed by the Office. He has an MS in Chemical Engineering and a BS in Chemical Engineering with expertise in renewable energy, environmental regulations, and econometric analysis. Mr. Haq has over 24 years of experience in the energy sector. He is certified as an Engineer-in-Training (EIT) in the State of Alabama.

### **WORK EXPERIENCE**

U.S. Department of Energy – Office of Energy Efficiency and Renewable Energy (EERE), Washington, D.C. (February 2006 – present)

Senior Analyst: At his current position, he is responsible for about \$6 million of analysis activities. These include: the development of the Biomass Scenario Model, the evaluation of cost of production for various biofuels, and modeling the land use change impacts of biofuels. The Biomass Scenario Model is a systems dynamics-based tool being developed to forecast the growth of the cellulosic biomass industry in the U.S. The model can investigate the impacts of different policy levers, technology assumptions, and market conditions such as oil prices on the growth of the cellulosic ethanol industry.

U.S. Department of Energy – Energy Information Administration (EIA), Washington, D.C. (June 1999 – February 2006)

Operations Research Analyst: Mr. Haq conducted economic studies utilizing computer models and provides analysis of renewable energy forecasts. The National Energy Modeling Systems (NEMS) model and its sub-modules are used to generate these forecasts. He is the lead analyst responsible for the biomass and landfill gas forecasts generated by NEMS, which appear in EIA's "*Annual Energy Outlook*". In addition, he participated with other staff members in special studies which are listed below.

Mr. Haq was responsible for forecasting the impact of environmental legislative initiatives. He assisted in the effort to model the impacts of the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR) on the electricity generation sector. He was involved in developing NEMS sensitivity cases investigating the impacts of carbon constrained scenarios. He has co-authored several EIA reports that have analyzed the potential impacts of regulating mercury, nitrogen oxides, sulfur dioxides, and carbon dioxide. He has received several awards for his work in this area (see list of awards and publications).

Energetics Inc., Washington, D.C.  
(October 1998 – June 1999)

Senior Engineer: Mr. Haq provided technical support services to the Department of Energy – Office of Power Technologies in the area of high temperature superconductivity. He assisted in the preparation of annual operating plans, presentations, and in the organization of a technical conference.

Princeton Energy Resources International LLC, Rockville, Maryland  
(May 1995 – October 1998)

Mr. Haq was employed as a Research Engineer at Princeton Economic Research, Inc. He conducted technical, economic, and market assessments of biomass, wind and other renewable energy technologies for

the Department of Energy and National Renewable Energy Laboratory (NREL). Mr. Haq was the task leader to conduct a market assessment of wind/diesel hybrid systems applicable for Alaskan villages.

Southern Company Services, Inc., Birmingham, Alabama

(December 1990 - May 1995)

Mr. Haq worked as a Senior Engineer in the Research and Environmental Affairs Department. Working with other team members Mr. Haq conducted an assessment of biomass gasification technologies suitable for retrofitting to an existing coal-fired boiler. A technical analysis was conducted of 35 different gasification systems available worldwide.

He gained extensive knowledge of coal gasification and combustion systems. He assisted in the design and engineering coordination of a DOE-funded coal gasification and fluidized bed combustion test facility called the Power Systems Development Facility (PSDF), in Wilsonville, Alabama. The focus of this \$277 million cost-shared facility is demonstration of an entrained-flow gasifier, testing of hot particulate removal technologies, and integration of fuel cells and aero-derivative gas turbines. He was responsible for the management of pilot scale tests of a coal gasifier.

Energetics Inc., Columbia, MD

(July 1986 - December 1990)

Research Engineer: Mr. Haq conducted technical feasibility studies of energy conservation concepts for the Department of Energy - Office of Industrial Technologies. In cooperation with Thermoelectron Corp., Mr. Haq managed a DOE funded Small Business Innovation and Research (SBIR) project which was funded for both Phases I and II to develop a novel thermal-to-electrical energy conversion device called the thermo-tunnel converter (TTC).

Lever Brothers Co., Baltimore, Maryland

(October 1985 - July 1986)

Process Development Assistant: Mr. Haq gained experience in a manufacturing environment at a detergent production facility. He retrofitted process equipment and implemented new operating procedures to enhance plant efficiency.

**EDUCATION**

The Johns Hopkins University, Charles and 34<sup>th</sup> Street, Baltimore, MD, 21218

Master of Science in Chemical Engineering, October 1985.

Thesis topic: Investigating vapor-liquid phase transitions that are caused by the presence of chemically reacting species, Dr. Joseph L. Katz, thesis advisor.

Northwestern University, 601 Clark Street, Evanston, IL, 60201.

Bachelor of Science in Chemical Engineering, June 1982. Emphasis on energy engineering.

High School: Thayer Academy, Braintree, MA., Graduated June 1978.

**COMPUTER SKILLS:** UNIX operating system, FORTRAN, ASPEN process simulation software, Visual Basic, proficient in personal computer applications such as spreadsheets, word processing and presentation software.

**CITIZENSHIP** US Citizen

## HONORS, AWARDS, AND SPECIAL ACCOMPLISHMENTS

1. Monetary award for special act or service, “In appreciation of your role in participating in EERE’s CEO Initiative by representing your Program Office and serving as a point of contact for future discussions. Your efforts have been exemplary and contributed significant benefits to EERE’s and DOE’s outreach with new stakeholders”, January 2008.
2. Monetary award for special act or service, “In appreciation for your outstanding performance supporting the Biomass Program and the role of cellulosic ethanol in the EIA Annual Energy Outlook forecast”, December 2007.
3. Monetary award for special act or service, “In recognition of your efforts on the request of analysis by Senator Jeff Bingaman to analyze the impacts of the National Commission on Energy Recommendations”, April 2005.
4. Monetary award for special act or service, “For rapid analysis and write-up of alternative strategies for reducing power plant mercury emissions at the request of Senator Inhofe”, March 2005.
5. Monetary award for special act or service (on the spot award), “In recognition of your electricity analysis and writing in connection with *Analysis of S. 1844, the Clear Skies Act of 2003; S. 843, the Clean Air Planning Act of 2003; and S. 366, the Clean Power Act of 2003, as requested by Senator James M. Inhofe*”, July 2004.
6. Monetary award for special act or service (on the spot award), “For your outstanding contribution to the Energy Information Administration’s analysis of a nationwide Renewable Portfolio Standard (RPS) requested by Senator Jeff Bingaman, Ranking Minority Member, Committee on Energy and Natural Resources”, June 2003.
7. Monetary award for special act or service, “In recognition of your significant contributions to the analysis of proposed energy legislation as requested by Senator Frank Murkowski, Ranking Member, U.S. Senate Committee on Energy and Natural Resources”, March 2002.
8. Monetary award for superior job performance in recognition of the Service Report “Analysis of the Climate Change Technology Initiative”, May 2000.
9. Monetary award for superior job performance in recognition of performance which has significantly contributed to the mission of the EIA/DOE, January 2000.
10. Certified as an Engineer-in-Training (EIT) in Alabama, No. ET9047

## PUBLICATIONS AND PRESENTATIONS

M. Duncan, B. C. Lippiatt, Z. Haq, M. Wang, R. K. Conway, “Metrics to Support Informed Decisionmaking for Consumers of Biobased Products”, U.S. Department of Agriculture, Agriculture Information Bulletin Number 803, available at <http://www.usda.gov/occe/energy/index.htm>, October 2008.

Z. Haq, and James Easterly, “Agricultural Residue Availability in the United States”, Proceedings of the Twenty-Seventh Symposium on Biotechnology for Fuels and Chemicals, Applied Biochemistry and Biotechnology, Vol. 129-132, Humana Press, 2006.

Energy Information Administration, “Impacts of Modeled Recommendations of the National Commission on Energy Policy”, Report number SR/OIAF/2005-02, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), April 2005.

Energy Information Administration, “Analysis of Alternative Mercury Control Strategies”, Report number SR/OIAF/2005-01, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), January 2005.

Energy Information Administration, “Analysis of S. 1844, the Clear Skies Act of 2003; S. 843, the Clean Air Planning Act of 2003; and S. 366, the Clean Power Act of 2003”, Report number SR/OIAF/2004-05, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), May 2004.

Z. Haq, “Energy Modeling Techniques”, Presentation to the South Asia Regional Initiative – Energy Workshop, Pokhara, Nepal, available at <http://eia.doe.gov/emeu/presentations/index.htm>, January 2004.

Z. Haq, “International Energy Outlook Projections”, Presentation to the South Asia Regional Initiative – Energy Workshop, Pokhara, Nepal, available at <http://eia.doe.gov/emeu/presentations/index.htm>, January 2004.

Z. Haq, “Estimating Rural Energy Demand”, Presentation to the South Asia Regional Initiative – Energy Workshop, Pokhara, Nepal, available at <http://eia.doe.gov/emeu/presentations/index.htm>, January 2004.

Z. Haq, “Combined Heat and Power in Bangladesh”, Presentations to the Dhaka Chamber of Commerce and Industry, the Bangladesh Power Development Board, and the Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, available at <http://eia.doe.gov/emeu/presentations/index.htm>, January 2004.

Z. Haq, “Renewable Energy in Bangladesh”, Presentation to Grameen Shakti, Dhaka, Bangladesh, available at <http://eia.doe.gov/emeu/presentations/index.htm>, January 2004.

Energy Information Administration, “Analysis of a 10-Percent Renewable Portfolio Standard”, Report number SR/OIAF/2003-01, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), May 2003.

Z. Haq, “Evaluating Biomass for Electricity Generation: How Much Cost? How Much Power?” *Biocycle*, Vol. 43, No. 11, November 2002, p. 33.

Z. Haq, “Biomass for Electricity Generation”, Energy Information Administration, July 2002, feature article available at <http://www.eia.doe.gov/oiaf/renewable.html>.

Z. Haq, “Biomass Resource Utilization in Bangladesh”, text box in *International Energy Outlook 2002*, page 114, DOE/EIA-0484(2002), March 2002, available at: <http://www.eia.doe.gov/oiaf/ieo/index.html>.

Z. Haq, “Micro-Credit for Micro-Electricity in Bangladesh”, text box in *International Energy Outlook 2002*, page 132, DOE/EIA-0484(2002), March 2002, available at: <http://www.eia.doe.gov/oiaf/ieo/index.html>.

Z. Haq, “Biomass for Electricity Generation in NEMS”, Presentation at the National Energy Modeling System Conference, Arlington, Virginia, available at: <http://www.eia.doe.gov/oiaf/aeo/conf/handouts.html>, March 12, 2002.

Energy Information Administration, “Impacts of Energy Research and Development (S. 1766 Sections 1211-1245, and Corresponding Sections of H.R. 4) With Analyses of Price-Anderson Act and Hydroelectric Relicensing”, Report number SR/OIAF/2002-04, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), March 2002.

Energy Information Administration, “Impacts of a 10-Percent Renewable Portfolio Standard”, Report number SR/OIAF/2002-03, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), February 2002.

Z. Haq, "Forecasting Electricity Availability in Bangladesh", Presentation to Bangladesh Ministry of Energy and Mineral Resources as part of USAID-funded seminar series, Dhaka, Bangladesh, June 2001, available at <http://eia.doe.gov/emeu/presentations/index.htm#01>.

Energy Information Administration, "Analysis of Strategies for Reducing Multiple Emissions from Power Plants: Sulfur Dioxide, Nitrogen Oxides, and Carbon Dioxide", Report number SR/OIAF/2000-05, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), December 2000.

Energy Information Administration, "Analysis of the Climate Change Technology Initiative: Fiscal Year 2001", Report number SR/OIAF/2000-01, Washington, D.C., available at [http://www.eia.doe.gov/oiaf/service\\_rpts.htm](http://www.eia.doe.gov/oiaf/service_rpts.htm), April 2000.

Z. Haq, J. A. James, and S. Kamal, "A Developing Country Perspective on Implementing Sustainable Energy Programs", American Solar Energy Society 1997 Solar Energy Forum, Washington, D.C., April 1997.

S. B. Ahmed, Z. Haq, T. C. Schweizer, and J. A. James, "Applicability of Renewable Energy Technologies in Developing Countries", Presented at the 1996 IEEE International Conference on Systems, Man and Cybernetics, Beijing, China, October 1996.

Z. Haq, P. Vimalchand, O. Davies, and J. Wheeldon, "The Test Program for the Power Systems Development Facility", Presented at the Thirteenth EPRI Conference on Gasification Power Plants, San Francisco, CA, October 1994.

D.L. Moore, P. Vimalchand, Z. Haq, and J.D. McClung, "PFBC Perspectives at the Power Systems Development Facility", Presented at the EPRI Conference on Fluidized-Bed Combustion for Power Generation, Atlanta, GA, May 1994.

R. R. Hardman, Z. Haq, and D. M. Boylan, "Technical Assessment of Biomass Gasification Systems", Report prepared by Southern Company Services, Inc., Birmingham, AL, December 1993.

Z. Haq, T. E. Pinkston, R. E. Sears, and P. Vimalchand, "The DOE/SCS Power Systems Development Facility", Presented at the Twelfth EPRI Conference on Gasification Power Plants, San Francisco, CA, October 1993.

R. E. Sears, Z. Haq, and P. Vimalchand, "Wilsonville Power Systems Development Facility", Presented at the Seventeenth Biennial Low-Rank Fuels Symposium, St. Louis, MO, May 1993.

Z. Haq, R. E. Sears, and T. E. Pinkston, "Gasification for the Wilsonville Power Systems Development Facility", Presented at the Ninth Annual Pittsburgh Coal conference, University of Pittsburgh, Pittsburgh, PA, October 1992.

Z. Haq, T. Johnson, and S. Hadley. "Economics of Commercial Scale Selective Agglomeration Plant". Report for the USDOE - Pittsburgh Energy Technology Center, prepared by Southern Company Services, Inc., Birmingham, AL, June 1991.

Z. Haq, "Assessment of Technologies to Convert Newsprint to Higher Value Products", Report for the DOE - Office of Industrial Technologies, prepared by Energetics, Inc., Columbia, MD, August 1990.

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Z. Haq, "Impact of CFC Phase-out on Chemical Solvents Industry", Report for the DOE – Office of Industrial Technologies, prepared by Energetics, Inc., Columbia, MD, July 1989.

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S.P. Buxbaum, Z. Haq, J.L. Katz, and R. Parch, "Thermally Induced Nucleation II: A New Way to Obtain Activation Energies", Journal of Chemical Physics, 85(9), November, 1986, pp. 5207-5211.



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