



## Carlos A. Pabon-Agudelo

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### SUMMARY

Economist with over 20 years of comprehensive experience in infrastructure sector. Specializes in economic utility regulation, market restructuring, structure and implementation of commercial and financing strategies, and assessment of economic and financial damages in international arbitrations. Strengths include economic and financial analysis; ability to build, lead and sustain engaged management teams; international onsite experience, and proficiency in four languages (Spanish, English, Portuguese, and French). Core competencies include:

- **Economic Expert Witness**
  - **Infrastructure Restructuring**
  - **Liability and Damages**
  - **Economic Policy Analysis**
  - **Economic Regulation**
  - **Economic Contract Analysis**
  - **Implementation of Regulatory Reforms**
  - **Institution Building**
  - **Project management/Bus. Development**
  - **Corporate finance and financial analysis**
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### EXPERIENCE

#### **Infrastructure Economic Consulting, LLC – IEC - Managing Director**

Washington, DC, 2016 -Present

Mr. Pabon is a regulatory economist providing expert witness support in international commercial and investment state arbitrations and consulting services in the infrastructure sector (power, oil & natural gas, mining, airports, water, etc.) to clients around the world. He provides expert support in a variety of international arbitration cases involving economic utility decision-making, breach of confidentiality, contracting, construction projects, market interaction, and contract disputes. Mr. Pabon has worked with governments, state-owned utilities, and corporations in Latin America, South Asia, Africa, Europe, and the US.

#### **NERA Economic Consulting Vice President**

Washington, DC, 1997 – 2016

Economic consultant specializing in restructuring and regulatory economic analysis of sustainable infrastructure projects for governments and private entities in the US, Latin America, Africa, India and Central Europe. Advised on privatization of state-owned utilities, public policy, strategic planning, market rules, structure and implementation of commercial and financial strategies, and pricing schemes. Consulting expert on international arbitrations in infrastructure projects.

- Provided consulting expertise on liability and financial damages cases in a variety of international arbitrations.
- Advised governments and private entities on economic and financial issues related to the development of electricity markets, market restructuring, valuation, regulation, corporate strategies, privatization and promotion of private initiatives and capital attraction policies, and establishment and support of regulatory agencies.
- Provided consulting support in the analysis of market rules, competition, consolidation of sector reforms, rate design, pricing policies for utilities and rate of return.
- Supported private companies as well as for electricity regulatory agencies and system operators on economic regulation, policy analysis, strategic corporate commercial analysis and strategic partnerships.
- Assessed regulatory frameworks and proposing market oriented solutions for developing electricity sectors.

Infrastructure Economic Consulting LLC

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- Oversaw regulatory reform programs in several jurisdictions around the world.

### **Ministry of Finance and Public Credit**

Bogota, Colombia, 1994 –1995

#### **Advisor**

Provided consultation to senior policy makers; developed policies, documents, and reports on public policy in infrastructure; analyzed and proposed regulatory reforms for utilities and put forth strategies for privatization of infrastructure assets.

- Advised the Minister of Finance on regulatory issues, strategic restructuring programs for utilities, participation of private investment in infrastructure, and initiation of infrastructure sector reform.
- Represented Ministry before the Energy and Gas Regulatory Commission technical committees.
- Participated in the development of Electricity Law and related instruments for restructuring of the sector.
- Developed financial strategies to transfer electricity assets of up to \$1.2 billion to private investors, analyzed and structured long-term financial schemes for energy projects; advised on the design of contracts for the wholesale energy market.
- Structured commercial strategies for the privatization of the coal complex El Cerrejón North Zone.

### **Carbones de Colombia – Carbocol -**

Bogotá, Colombia, 1990 - 1994

#### **Chief Planning, Evaluation and Negotiation Department**

Managed team performing economic and socio-economic analyses for the Colombian coal sector and provided planning, negotiation and evaluation guidance to develop the coal sector.

- Assessed and proposed commercial and financial strategies for coal projects greater than 10 M tons/year and coordinated the promotion of coal thermal projects among private investors for up to 1200 MW.
- Participated in the establishment of the National Energy Plan 1993-2000 and represented the company before National Energy Commission (NEC).

## **OTHER RELEVANT EXPERIENCE**

### **Universidad de los Andes**

Bogotá, Colombia

#### **Economic Researcher**

Developed public policy analysis and cost benefit analysis for the Colombian government and multilateral organizations (Inter-American Development Bank -IDB- and World Bank). Researched economic development issues. Assisted program director on training programs sponsored by the IDB on cost benefit analysis.

## **EDUCATION**

- **Master in International Public Policy**, School of Advanced International Studies, Washington DC.
- **Certificate – Business Administration**, Georgetown University, Washington DC.
- **M.A. – Economic Development**, Universidad de los Andes, Bogotá, Colombia.
- **B.S. – Economics**, Universidad de los Andes, Bogotá, Colombia.

## **PUBLICATIONS**

- *“The Economics of Contracts in International Arbitrations,”* at Young Arbitration Review, May 2018

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- “*The Use of Economics in International Arbitrations,*” at <http://arbitrationblog.kluwerarbitration.com/2017/06/05/use-economics-international-arbitrations/>, June 2017.
- “*Power Sector Reform – Is there a Road Forward?*” (with Michael B. Rosenzweig and Sarah Voll); Electricity Journal, July 2006.
- “*Power Sector Reform – Experiences from the Road,*” (with Michael B. Rosenzweig and Sarah Voll); Electricity Journal, November 2004.
- “*A Proposed Alternative to Locational Marginal Pricing and its Impact on New Generation*” (with Sarah Voll), Electricity Journal, September 2004.
- “*Alternatives to the Elimination of Cross-Subsidies: The Case of Brazil*”, Electricity Journal, May 2003
- “*Cross Subsidies-the Economic Impact of the Tariff Realignment in Brazil,*” Electricity Journal, December 2002.
- “*Power Sector Reform in Brazil – Challenges to Private Investment*” Project Finance International, July 25, 2001. Co-author.
- “*Technical Codes and Performance Standards for Orissa*”, NERA, September 1998.
- “*Methodology for Estimating the Real Exchange Rate: The Colombian Case*”, National Planning Department, January 1990. Rev. Desarrollo y Sociedad, Universidad de Los Andes. Bogotá, Colombia, No. 27, 1991.
- “*The Shadow Price of the Foreign Exchange in Colombia*”, Inter-American Development Bank. November 1989. Rev. Desarrollo y Sociedad, Universidad de Los Andes. Bogotá, Colombia, No. 24. 1990.

## SIGNIFICANT ASSIGNMENTS

### INTERNATIONAL ARBITRATIONS & US POWER SECTOR

- **Confidential Case**  
As an economic and damages expert, provided expert testimony in an international arbitration matter involving a power plant construction project. The case centered around a construction delay claim and associated market penalties. The team assessed the economic validity of the claim from a regulatory perspective and demonstrated that the economic and commercial decisions made by the plant operator led not only to the imposition of penalties but also to an increase in their magnitude. Mr. Pabon opined that the decisions of the operator were made in a complex regulatory environment and driven by its own risk profile and that those choices were not required by market economics or the technical limitations of the plant.
- **Confidential Case**  
Provided an expert report on damages in an international arbitration case about the seizure of Claimant’s investments, the revocation of a tax exemption that had initially been enjoyed by Claimant, and, ultimately, the elimination of Claimant’s opportunity to earn a return on and of his investment. Mr. Pabon’s team assessed damages and economic implications of the expropriation of Claimant’s investment, which included an assessment of country risk and interest.
- **Confidential Case**  
As an economic expert, provided expert testimony in an international arbitration case of a road concession. Assessed the contract’s price adjustment mechanism, and the alleged lost revenues. Demonstrated that the former, as suggested by Claimant, was based on a wrong reading of the contract, inconsistent economic principles and industry practices, would have led to inefficient economic outcomes which lead to the conclusion of a baseless revenue shortfall.

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- **Carib-Consult v. ESI and Florida Power & Light (“FPL”)**  
As an economic expert, supported international investor on claim of breach of contract for not paying for services related to alleged bid to build a thermal power plant in the Dominican Republic. Services included the economic analysis of the power sector reform efforts, analysis of the damages claim, and criticism of methodology used.
- **Confidential Case**  
As a consulting expert, provided economic/commercial contract interpretation to Claimant’s request for modification of the royalty calculations associated with its hydrocarbon exploitation concession contract in a Latin American country. Assessed economic implications of Claimant’s request as well as damages claim.
- **Mercer International Inc. v. Government of Canada**  
As a consulting expert, provided economic/regulatory expertise related to claims of discrimination and unfair treatment in violation of the NAFTA treaty. Assessed regulatory and economic policy related to the self-supply requirements of pulp and paper mills in Canada with cogeneration capacity. Assessed damages claim presented by Claimant.
- **Confidential Case**  
As a consulting expert, determined the quantum of damages associated with the lost energy and capacity value arising from a delay in the construction of a large generation asset in a European country.  
**Isolux Corsán Concesiones v. The Republic of Peru**  
Provided consulting expertise on behalf of the Government of Peru related to claim of breach of bilateral investment treaty. Assessed claims of bad faith negotiations and discrimination made against the Government and damages presented by Claimant.
- **Confidential Case**  
As a consulting expert, on behalf of international investor in power plant special purpose vehicle, provided independent assessment of value of shares in that company, including analysis of the electricity market.
- **Caravelí Cotaruse Transmisora de Energía S.A.C - CCTE v. Government of the Republic of Perú.**  
Consulting expert analyzing the nature of the concession regime in Perú, the importance of contracting in modern economies and assessing damages arguments presented by Claimant.
- **AEI Asia Limited v. Michael Yap Kong Hwee.**  
Consulting expert addressing the damages suffered as a result of a defective power plant/desalination cogeneration project sold to AEI by a private developer.
- **Private Investor v. the Government of the Dominican Republic.**  
As consulting expert, provided support in a breach of a concession contract for electricity distribution service. Addressed liability and damages issues for the Respondent pointing out inconsistencies in claim; fallacies of arguments; jurisdictional differences between BIT and local regulations. The case settled on terms favorable to client.
- **Roz v. Coca-Cola and the Republic of Uzbekistan.**  
Consulting expert analyzing on damages for breach of contract.
- **Aguaytia Energy LLC v. Government of Perú.**  
Consulting expert analyzing comparative electric utility regulatory systems, industry practice regarding electric sector concessions, applicable compensation, and damages issues on behalf of the government of Perú. Analyzed alleged violation of a Legal Stability Agreement related to discrimination in the setting of compensation for electricity transmission services.
- **Fraport AG v. Republic of Philippines Arbitration.**  
Consulting expert for the economic analysis of the concession agreement for the expansion of the Ninoy Aquino International Airport for arbitrations before the ICSID and the ICC.
- **Turkish Power Project Arbitration.**  
Consulting expert in charge of assessing the associated damages for breaching a concession contract. Coordinated NERA’s efforts in the estimation of lost profits due to the cancellation of PSEG Global’s IPP in Turkey and assessed the business practices undertaken by PSEG during pre-construction period of the project.

- **AES CESCO v. GRIDCO.**  
Acted as consulting expert in assessing from an economic perspective the economic and regulatory issues involved in Gridco's claim regarding CESCO.
- **AES/Dow Chemical Arbitration.**  
Acted as consulting expert for determining the liability and the damages associated with the breach of contract between AES and Dow Chemical in the selling process of Dow's power plant Elsta, located in Holland.
- **Constellation New Energy Damages.**  
Part of a team that analyzed and provided a response in a litigation concerning breach of confidentiality in load management programs. Helped write the expert report and reviewed damages calculations presented by the counterparty.
- **Brazil Countervailing Tariff.**  
Advised a complainant in the ferrosilicon industry on Brazilian electricity subsidies.
- **Comments on FERC SMD NOPR - Cinergy Services Inc.**  
Assisted with market and regulatory concepts for the draft of Cinergy's comments, in particular with the assessment of the economic effects of through and out rates in the context of FERC's investigation of the justness and reasonableness of the through and out rates in MISO and PJM and in the design of a demand response mechanism.
- **Automatic Mitigation Procedures.**  
For a US Independent Power Producer analyzed price spike mitigation procedures proposed to FERC and developed an alternative approach based on demand side bidding. Work also included the assessment of proposals presented by other market participants in the US. Filed before FERC as an alternative to avoid price spikes.
- **Niche Market Study.**  
For a southwestern utility in the US, led the effort to provide an overview of the reasons why niche markets can exist and provide examples of niches in other industries and in other parts of the energy industry. Discussed the longevity of the factors that permit niche markets to exist and the actions niche occupants can take to influence the life of those factors.
- **Assessment of Margins on Customized Products.**  
Led a group to design a methodological approach to measure the magnitude of the margin that a US utility has earned by selling customized products.
- **Business Strategy to Major Utility in Southwestern US.**  
Managed team that evaluated the strategic alternatives of a utility in the US. This involved modeling the power market in the western United States and carrying out quantitative analyses to assess the financial impact of several strategic possibilities on the utility's financial strength. The analysis included expanding the current style of power marketing activities by investing in new generation assets, investing in the assets of a power cooperative, and backward integrating into generation fuels (coal and natural gas).
- **Analysis of Competitiveness of Power Plants.**  
Led the effort to identify and assess technical alternatives available to a US utility to increase the competitiveness of its plants in the context of the marketing and financial mechanisms available in the new deregulated markets for electricity in the United States.
- **Due Diligence for Private Investor.**  
Regulatory expert analyzing economic implication of current and future structure of asset for further acquisition.
- **Analysis of Competing Generation Technologies.**  
For an international investor analyzed the economics of renewable generation assets (wind farm assets) after the expiration of assumed initial purchase contracts and provided view of the current marginal technology and probable bus-bar costs in those regional markets where the company expected to have wind projects.

## LATIN AMERICA INFRASTRUCTURE SECTOR

- **Design and implement commercial strategy for growth in Latin America.** For NERA, design and implement advisory practice focused on electricity, natural gas and international arbitrations.
- **Design of Commercial and Energy Strategies.** For Duke Energy do Brasil, led team to assist in the design of a commercial and energy strategy to be implemented in the first energy auction held in Brazil in 2004. The work included the analysis of auctions rules and development of proposals to improve the auction outcome, the review of the commercial position of the company before its competitors, and the analysis of the role of “pivotal suppliers” in the Brazilian markets.
- **Asset/Regulatory Strategy Analysis.** Coordinated the efforts to develop an asset strategy for an IPP in the Dominican Republic. Work included analysis of the regulatory framework in the DR, development of a regulatory strategy to improve the company position, and analyses to improve the value of the asset.
- **Analysis of Technical Note for AES-Sul.** Assisted the distribution company with its analysis of and response to the preliminary report of ANEEL in its first tariff revision. Issues raised were related to revenue requirement, cost of capital, efficiency gains, rate base valuation, and benchmarking techniques.
- **Tariff Realignment - Duke Energy do Brasil.** For a group of private generators in Brazil, analyzed a set of rules proposed by the government related to tariff issues and their impact on the development of new business opportunities in the large industrial segment market. The project included the development of a set of mechanisms, based on economic principles, to eliminate cross subsidies currently applied to a group of industrial users aiming to introduce efficient economic signals to the electricity market.
- **Analysis of Revitalization Measures.** For an international private investor in Brazil, analyzed set of recently published regulatory rules issued by the Brazilian government and proposed economic, efficient alternatives. Topics studied included distribution and transmission tariffs, mechanism for promotion of new generation in the Brazilian market, governance of system operator, restructuring of governmental institutions, consumer issues; deverticalization of industry, cross-ownership, etc.
- **International Experience on Separation of Distribution and Retail Segments.** For Duke Energy conducted an international survey on experiences on deverticalization, elimination of cross-subsidies, determination of distribution tariffs and divestiture of retail segment. Study was the base for further discussion with the government on revitalization measures.
- **Segmenting the Brazilian Electricity Market.** For Duke Energy led efforts in the development of a position paper, for further discussion with government officials, that assesses a possible segmentation of the market with respect to its consistency with objectives of reform, and especially its effect on the willingness of investors to place funds into the sector. The paper describes the flaws of the government’s proposals from the perspective of capital attraction and provides alternate proposals to segmentation.
- **Barriers for Purely Private Investment in Brazilian Generation.** Advised Duke Energy in the analysis of the Californian and Brazilian electricity market to identify market design and regulatory or implementation problems that discouraged investment in generation capacity in those markets.
- **Tariff and Regulatory Analysis.** For a distribution company, Bandeirante Energia S.A, led a team that assessed internal tariff capabilities of the company, proposed regulatory arrangements to pursue the company’s tariff objectives, developed a computational model to calculate approximate revenue requirement for various test years, and analyzed the simulation’s output from a regulatory perspective.
- **Regulatory Analysis.** For Elektro, Electricidade e Serviços SA led a group of consultants in the analysis of tariff issues of the company. The tasks included collection and assessment of data necessary for estimating the revenue requirement, development of a model to calculate the revenue requirement for various test years, sensitivity analysis to various parameters, development of a methodology for calculating the cost of capital and capital structure of the company and identification of alternative treatments of various components of the revenue requirement and the evaluation of their impact on Elektro’s financial performance.
- **Analysis of Draft Resolutions on Tariff Issues.** For the association of distribution companies, ABRADDEE, provided technical advice in the assessment of the Draft Resolutions issued by ANEEL regarding the Public



Audience No. 007/2000 that deals with the economic concepts for tariffs revisions, tariff readjustments and extraordinary tariff revisions.

- **Training in Commercialization of Energy Strategies.** For a group of executives of the Guaraniana Group, coordinated a team that provided technical training on strategic and organizational issues related to the development and operation of an energy trading company. Topics of this technical support included: identification of corporate objectives and strategies in energy, assessment of market environment, analysis of strategic uses of utility assets in energy, assessment of the impact of regulatory and structural arrangements on energy trading companies, analysis of risk management strategies and organizational issues of energy trading business, and assessment of the California experience. This training seminar included technical visits to US Energy Trading floors.
- **Simulation of Revenue Requirement.** For a group of companies owned by AES Corp., led a team that determined tariff revenues, rate base, and cost of capital determination. The analysis included the simulation of the company's revenue requirement, assuming standard rate-of-return regulatory treatment, sensitivity analysis to various parameters (e.g. test year, O&M and cost of capital, capital structure, rate base valuation method, treatment of non-concession activities), and assessment of results from a regulator's perspective.
- **Analysis of Economic-Financial Equilibrium (EFEQ).** For a group of distribution companies owned by AES Corporation, participated in the conceptual analysis of the distribution Concession Contracts in Brazil in order to determine an approach to define EFEQ from an economic perspective. Also participated in the design of a practical approach for determining EFEQ of the concession contracts and the firms.
- **Design of "X" Factor Methodology.** Advised a distribution company, Eletropaulo, in the conceptual development of a methodological approach for determining the "X" factor under the framework of Performance Based Regulatory regime currently in place in Brazil. Reviewed the regulatory framework to advise the utility in the development of a position on the X factor for discussion with the regulatory body to recover missed revenues through the efficiency factor.
- **Regulation of Tariff and Strengthening Program.** For the National Regulator – ANEEL – provided technical support in the developing of regulatory and economic principles for developing tariffs and procedures for tariff revisions and extraordinary tariff revisions. Participated in the development of an implementation plan for ANEEL for the improvement of non-tariff related aspects of economic regulation currently in place in Brazil.
- **Commercialization of Ancillary Services in Brazil.** Worked for the System Operator (ONS) in order to develop a set of recommendations for the commercial procurement of Ancillary Services in Brazil. Work included an international survey on the provision of ancillary services in different jurisdictions, the establishment of a Brazil-specific economic framework for the analysis of procurement of ancillary services, and the development of recommendations for commercialization of ancillary services.
- **Analysis of Wholesale Electricity Market in Brazil.** Member of a team working for three Brazilian distribution companies analyzing proposed rules for the electricity wholesale market in Brazil. The work involved a review of the proposed structure of the wholesale market, and an analysis of market rules to resolve controversial points, and to ensure coherent and efficient operation of the WEM.
- **Distribution Tariffs for Retail Wheeling Customers in Brazil.** Worked on distribution tariffs for retail wheeling customers for ANEEL. Assignments included the analysis of alternative methods of deriving distribution tariffs, revision of proposed rules for setting distribution tariffs, analysis of competitive provision of revenue cycle services, and development of a survey of retail wheeling in thirteen US states and a variety of countries around the world.
- **Regulatory and Organizational Strategy for an Electric Utility Entering the Telecommunications Market.** Conducted a survey of the international experience of electric-telecommunications convergence. Developed a regulatory and organizational strategy for the entry of the Brazilian transmission company, ELETROBRAS, into the telecommunications market.
- **Privatization of a Distribution Company – COSERN.** Work centered on the valuation of the company for the purpose of its later sale. Assignments included the assessment of new business opportunities for the new

company and worked closely with Brazilian consulting advisers to evaluate the impact of sector regulation on the market value of the company.

- **Regulatory Reform in Latin America – IDB.** Part of a team that undertook a thorough evaluation of the regulatory frameworks in the power and natural gas sectors in a select group of Latin American countries. This work involved the preparation of a report that developed a conceptual framework for reform and privatization, then comparing this framework with the reform and privatization experiences in Argentina, Bolivia, Brazil, Chile, Colombia, Perú and El Salvador and presenting recommendations for IDB loan and technical assistance policy.

## **AFRICAN & CENTRAL EUROPEAN POWER MARKETS**

- **Regulatory Review for Cameroon.** For a private investor, managed a project that analyzed the current regulatory framework in Cameroon. The objective of the work was to determine alternative mechanisms to improve the financeability and sustainability of the Cameroonian electricity sector.
- **Slovakia Market Design – RONI.** Supported the regulatory agency in Slovakia –RONI – in the development of a model for the redesign of the wholesale electricity market, including the design of the market rules and regulation of transmission and generation in the context of the privatization of the sector. Mr. Pabon was co-leader of the development of the specifications of the price regulation formula for transmission business, methodology and the process guiding price reviews of transmission, calculation of the revenue requirement, and development of guidelines for determining cost-reflective transmission tariffs and procedures for ensuring non-discriminatory access to the transmission system.
- **Regulation of Electricity Distribution, Slovakia.** Supported the Regulatory Office in Slovakia in the design of a new price regulation regime applicable to electricity distribution companies. Work included the development of recommended price regulation regime, formulas applicable to end users, access prices and calculation of revenue requirements of three distribution companies.

## **INDIAN POWER SECTOR**

- **Structural Power Sector Reform in India.** Participated in a team responsible for the design and development of the regulatory framework for the reform of Orissa and Haryana electric power sector. Responsibilities included: analysis of legislation, regulations, licenses and guidelines; design and implementation of on-site regulatory training; on-site consulting on competitive procurements, performance standards, consumer affairs, regulatory economics, internal organization and operating procedures.