



September 13, 2006

VIA FAX & OVERNIGHT COURIER

Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Attention: Ms. Kirsten Walli, Board Secretary

Dear Ms. Walli:

Re: Technical Conference September 18-22, 2006
Cost of Capital (EB-2006-0088) and 2nd Generation Incentive Regulation
Mechanism (EB-2006-0089)

Newmarket Hydro is pleased to submit the enclosed seven written copies of the 30-minute presentation we plan to deliver, along with our technical experts from Energy and Environmental Economics Inc., during the OEB's Technical Conference taking place next week September 18-22, 2006. Electronic versions in searchable Adobe Acrobat (PDF) and PowerPoint have also been emailed.

As outlined in the OEB's web posting of August 31, 2006, we are pleased that the Board has adopted for the technical conference a "consultative process" to provide policy direction rather than an adjudicative approach. Further, we appreciate that the technical conference "will provide each participant's expert ... with an opportunity to make a presentation on issues associated with the Board's selection of cost of capital and 2nd generation incentive regulation methodologies." This will give participants and their respective experts a chance to clarify and elaborate on their written comments to Board Staff's proposals. We and our technical experts look forward to hearing the alternatives supported by other parties and to gaining a clearer understanding of significant issues and areas of concern. The exchange of ideas fostered by this consultative process will no doubt lead to the development of sound policy, grounded in proper theory, and of benefit to all stakeholders in this process.

Yours truly,

A handwritten signature in blue ink, appearing to read "Iain Clinton".

Iain Clinton, CA
Chief Financial Officer
Tel: 905-953-8548 ext 2300
Email: iclinton@nmhydro.ca

OEB Technical Conference

Appropriate Cost of Capital and Capital Structure Findings (EB-2006-0088)

Ron Warrington
Michele Smart
Energy And Environmental Economics

Iain Clinton
Newmarket Hydro

September 18-22, 2006



Presentation Agenda

- ❖ Discussion of proper application of CAPM formulas
 - Asset Return and ROE
- ❖ Background information on capital structure and cost of capital
 - Summarizes E3's expert testimony
- ❖ E3's comments on Staff's latest proposal
- ❖ E3's recommendations

Proper Application of CAPM Formulas



Summary of Corrected CAPM Results

- ❖ The Board should have accurate CAPM results when considering ROE alternatives
 - ROE = 10.4% using Staff assumptions
- ❖ In their June 14, 2006 report, Lazar and Prisman fail to re-lever their calculated asset returns of 5.78% to 7.02%
 - 7.02% asset return yields 11.8% ROE
- ❖ In their July 25, 2006 report, Staff attempts to re-lever but misapplies a shortcut formula
 - The result: equity returns lower than implied debt rates
 - Staff's 7.87% ROE, correctly calculated, is 10.4% ROE
- ❖ E3, relying on standard finance formulas, describes:
 - Calculation and relevance of asset return
 - Correct method of calculating equity return
 - List of referenced formulas also provided

Asset Return Discussion

- ❖ Relying on the same methodology as Lazar and Prisman
 - E3 calculated 6.47% asset return using:
 - 60-month all rate-regulated scenario - per the data Staff provided in Appendix A of the Board staff's second report dated July 25, 2006
 - $\beta_e = 0.47$, $\beta_a = 0.29$, $T = 0.36$, $E = 40\%$, $D = 60\%$, $R_m = 10.06\%$, $R_f = 5.01\%$
 - Staff did not calculate asset returns in 25 July report
- ❖ The calculated asset return provides appropriate compensation for companies with similar risk
- ❖ The ROE requires:
 - The calculated Asset Return
 - Assumed Capital Structure
 - Assumed Debt Interest Rate

Equity Return Calculation

- ❖ Assumed debt interest rate
 - Staff previously proposed 6.01%
 - Note: the interest rate used in the WACC calculation must be the interest rate used to reimburse distributors
 - A lower debt rate yields a higher equity return; a higher debt rate yields a lower equity return; each must achieve WACC of 6.47%
- ❖ Assumed Capital Structure
 - Staff proposed 60:40 debt/equity
- ❖ E3 calculated ROE using Staff's values
 - Use formula $R_a = E * R_e + (1-t) * D * R_d$ and solve for R_e
- ❖ 10.4% ROE is the correct equity return

Cost of Capital Formulas and Sources

1	$R_d = R_f + \beta_d * (R_m - R_f)$
2	$R_a = R_f + \beta_a * (R_m - R_f) = WACC$
3	$R_e = R_f + \beta_e * (R_m - R_f)$
4	$R_a = E * R_e + D * (1 - T) * R_d = WACC$
5	$R_d = [R_a - E * R_e] / [D * (1 - T)]$
6	$R_e = [R_a - D * (1 - T) * R_d] / E$
7	$\beta_a = [\beta_e * E + \beta_d * D * (1 - T)] / [E + (1 - T) * D]$
8	$\beta_a = \beta_e / [1 + (1 - T) * (D/E)]$
9	$\beta_e = \beta_a * [1 + (1 - T) * (D/E)]$

Background Information

Capital Structure



Small Utility Business Risk Not Forecast to Significantly Diminish

- ❖ Small utilities have amplified business risk due to:
 - Concentrated geographic area
 - Local economy, local grid events
 - Small asset base, fewer customers
 - See example on following slide which demonstrates substantial throughput fluctuation impacts on small LDCs
 - Operating in an evolving regulatory climate
 - Only improving regulatory climate may somewhat reduce small LDC risk

Throughput Impact on Small LDCs

Example:
Loss of one customer of
approximately 10,000
MWhs (1 – 2 MW
customer)

	Large LDC	Small LDC
Customers	50,000	25,000
Sales kWh/customer	12,500	12,500
Sales kWh	625,000,000	312,500,000
Rate Base	100,000,000	50,000,000
Equity Return	10.5%	10.5%
Debt Interest	6.0%	6.0%
D:E	50.0%	50.0%
Expenses	12,250,000	6,125,000
Interest	3,000,000	1,500,000
Depreciation	4,000,000	2,000,000
Equity return	5,250,000	2,625,000
Revenue Requirement	24,500,000	12,250,000
Rate \$/kWh	\$ 0.039	\$ 0.039
Equity	50,000,000	25,000,000
ROE	10.5%	10.5%
Large Customer Lost kWh	10,000,000	10,000,000
Reduced rate revenue	24,108,000	11,858,000
Reduced return	4,858,000	2,233,000
Reduced ROE	9.7%	8.9%

Background Information

Cost of Capital



Asset Return Discussion

- ❖ Asset return provides appropriate compensation for companies with similar risk to beta comparables
 - Asset return must be higher for companies with higher risk
 - This means a higher values for β_e , β_a
 - $\beta_e = \beta_a * [1+ (D/E)]$, $R_a = R_f + \beta_a * (R_m - R_f)$
- ❖ One asset return can support many potential equity returns, depending on assumptions for:
 - Percent debt in capital structure (“re-levering” asset return)
 - Debt interest rate
 - $R_a = E * R_e + D (1-T) * R_d = WACC$

US Utility Data Validates E3's Calculated Equity Return

- ❖ With a 6.47% asset return, the equity return we calculated using Staff values is 10.4%
 - 10.9% with 50bp adder
- ❖ 2005 Allowed ROE decisions for US utilities averaged 10.58% (see Appendix)
 - These are much larger than Ontario's LDCs – average \$7 billion net utility plant versus \$117 million average net fixed assets for all Ontario LDCs (per 2006 EDR filing)
 - US electric sector has a more evolved regulatory climate than Ontario electricity sector so should earn lower return
- ❖ Data from U.S. utilities therefore supports E3's calculated equity return value

Capital Structure, Risk & Return

- ❖ Asset return provides appropriate compensation for companies with similar risk (β_a)
- ❖ Asset return must be higher for companies with higher risk
 - Observed β_e of comparable firms will be higher
 - Therefore β_a , WACC, ROE will also be higher
- ❖ Ibbotson states higher β does not account for all risks faced by those who invest in small businesses and advocates an additional small business premium based on the firm's equity market capitalization¹

Evaluation of New Staff Proposal to Maintain Current Methodology



Merits of Current Methodology

- ❖ Maintaining current cost of capital method will add to perception of industry stability
 - benefit to LDCs – improved access to capital
- ❖ Capital structure differentiation based on size compensates small LDCs for their increased risk
- ❖ Providing higher deemed debt rate compensates smaller distributors for increased risk

Issues with Current Methodology

- ❖ Difficult to administer 4 capital structure tiers
- ❖ 4 deemed debt rates adds to complexity
- ❖ For LDCs of all sizes, after-tax asset returns are too low
 - See table on following slide

2006 After-Tax Asset Returns Using Current Methodology

Capital Structure	Debt Rate	After Tax Debt Rate	Equity Return	After Tax Asset Return
65:35	.0580	.0371	.0900	.0556
60:40	.0590	.0378	.0900	.0587
55:45	.0600	.0384	.0900	.0616
50:50	.0625	.0400	.0900	.0650

The Staff's assumptions lead to a 6.47% After Tax Asset Return

ROEs above do not include 50bp adder

Current Methodology Summary & Implications

- Cannon's current 9% ROE value with a 50:50 capital structure provides a 6.5% asset return
 - A 6.5% asset return is appropriate for LARGE utilities with similar risks to beta comparables
 - Currently smallest utilities receive a 6.5% asset return
 - A 10.4% ROE with a 60:40 capital structure will also provide large LDCs with a 6.5% return
- Small LDCs must receive a higher return to compensate them for additional risk not reflected in beta comparables

ROEs above do not include 50bp adder



Which ROE Methods Are Appropriate?

- ❖ All methods, when applied correctly, will result in similar ROEs for companies with similar risk and a similar capital structure
 - For CAPM, must select:
 - Appropriate comparable companies
 - Appropriate market return and riskless rate
 - Appropriate cost of utility debt
- ❖ Asset return results from application of CAPM
- ❖ Once asset return has been calculated, a wide range of equity returns result, depending on assumptions for:
 - Percent debt in capital structure (“re-levering” asset return)
 - Debt interest rate
 - Use formula: $R_a = E * R_e + D * (1-T) * R_d = WACC$
- ❖ ROE is calculated based on capital structure and debt rate assumptions
 - Plus 50bp for transaction costs

Can LDCs Rely Solely On Long-Term Debt Financing?

- ❖ No
- ❖ Why? Third party lenders will require adequate coverage ratios on borrowings
 - Will limit amount of debt that may be borrowed
 - Must have equity returns in capital structure to provide debt coverage
- ❖ LDCs could sustain significant amounts of debt in their capital structure, provided coverage ratios support this

Are Investment Incentives Necessary?

- ❖ If ROE is sufficient, an incentive will not be necessary
 - Incentives for new infrastructure investment will only be necessary if existing returns are not high enough to attract capital, i.e., if investors can achieve a higher return with lower risks in other jurisdictions
- ❖ If additional incentives were necessary, investors would likely require their distribution as dividends
 - Dividend restrictions would thwart additional investment
- ❖ E3 sees no indications of a liquidity crisis, provided appropriate asset return levels are maintained
 - Global capital will flow to investment opportunities that provide appropriate returns commensurate with risk

E3's Recommendations



E3's Proposal

- ❖ Staff's July 25 proposal, fixing both equity return and capital structure, is insufficient to equitably compensate smaller utilities for greater risks inherent in their business
- ❖ We propose a capital structure of 50:50 for distributors with rate base of less than \$100 million and capital structure of 60:40 for larger distributors
 - Reduces capital structure tiers to two
 - Easier to administer
 - Same 10.4% equity return applied in both tiers
 - Equity return based on 60:40 capital structure thereby providing large LDCs with adequate return
 - Provides additional return for small LDCs at 50:50 D:E
 - 10.9% ROE with 50 bp adder
 - Same 6% debt rate applied in both tiers

Benefits of E3's Proposal

- ❖ Two tiers, one equity return, one debt rate simplifies OEB administration
- ❖ Capital structure simplified based on Cannon tiers
 - Viewed as maintaining regulatory stability
- ❖ Deemed debt rate using Staff's proposal – approx. 6.0%
 - In range of Cannon values, maintains regulatory stability
- ❖ Sufficiently long debt term to adequately support debt and equity
 - Match 20 to 25 year depreciation component of revenue requirement
- ❖ Equity return of 10.4% (10.9% with 50bp adder) will allow distributors to attract necessary capital
 - Provides return equivalent to US publicly traded regulated utilities
- ❖ Applying this equity return to 50:50 capital structure for small utilities provides them with additional return for small LDC risks
- ❖ Capital structure in place through at least 2010

Appendix



US Utilities

2005 ROE and Net Utility Plant Values

Date	Company	State	Allowed ROE	Yield on 10 Year Treasury	BP Spread
1/6/2005	South Carolina Electric & Gas	SC	10.70%	4.29%	641
1/28/2005	Aquila	KS	10.50%	4.16%	634
2/18/2005	Puget Sound Energy	WA	10.30%	4.26%	604
2/25/2005	PacifiCorp	UT	10.50%	4.27%	623
3/10/2005	Empire District Electric	MO	11.00%	4.46%	654
3/24/2005	Consolidated Edison	NY	10.30%	4.59%	571
3/31/2005	Texas -New Mexico Power	TX	10.25%	4.50%	576
	1st Quarter Averages		10.51%	4.36%	615
4/4/2005	Central Vermont Public Svc	VT	10.00%	4.46%	554
4/7/2005	Arizona Public Service	AZ	10.25%	4.47%	578
5/18/2005	Entergy Louisiana	LA	10.25%	4.07%	618
5/26/2005	Savannah Electric & Power	GA	10.75%	4.08%	667
5/26/2005	Altantic City Electric	NJ	9.75%	4.08%	567
6/8/2005	Public Svc New Hamprshire	NH	9.62%	3.94%	568
	2nd Quarter Averages		10.12%	4.18%	592
7/19/2005	Wisconsin Power and Light	WI	11.50%	4.23%	727
8/5/2005	Cap Rock Energy	TX	11.75%	4.43%	732
8/15/2005	AEP Texas Central	TX	10.13%	4.27%	586
9/28/2005	PacifiCorp	OR	10.00%	4.26%	574
	3rd Quarter Averages		10.85%	4.30%	655
12/12/2005	Madison Gas and Electric (WI)	WI	11.00%	4.55%	645
12/13/2005	OGE Electric Service (OK)	OK	10.75%	4.54%	622
12/16/2005	Pacific Gas and Electric (CA)	CA	11.35%	4.45%	690
12/16/2005	San Diego Gas & Electric (CA)	CA	10.70%	4.45%	625
12/16/2005	Southern California Edison (CA)	CA	11.60%	4.45%	715
12/22/2005	Wisconsin Public Service (WI)	WI	11.00%	4.44%	656
12/21/2005	Cincinnati Gas & Electric (OH)	OH	10.29%	4.49%	581
12/21/2005	Avista (WA)	WA	10.40%	4.49%	592
12/22/2005	Consumers Energy (MI)	MI	11.15%	4.44%	671
12/28/2005	Westar Energy North (KS)	KS	10.00%	4.38%	562
12/28/2005	Kansas Gas and Electric (KS)	KS	10.00%	4.38%	562
	4th Quarter Averages		10.63%	4.46%	629
	2005 Average		10.58%	4.35%	621

Source: Regulatory Research Associates

Company	Net Utility Plant \$000s
AEP Texas Central Company	4,180,338
Aquila, Inc.	3,862,020
Arizona Public Service Company	9,789,299
Atlantic City Electric Company	2,798,618
Avista Corporation	2,938,315
Central Vermont Public Service Corp	563,867
Cincinnati Gas & Electric Company	6,912,285
Consolidated Edison	21,221,340
Consumers Energy Company	12,125,379
Empire District Electric Company	1,129,533
Entergy Louisiana, Inc.	5,999,929
Kansas Gas and Electric Company	3,866,230
Madison Gas and Electric Company	1,004,627
Oklahoma Gas and Electric Company	3,276,829
Pacific Gas and Electric Company	32,176,193
PacifiCorp	12,586,448
Public Service Co of New Hampshire	2,359,613
Puget Sound Energy, Inc.	6,322,910
San Diego Gas & Electric Company	7,131,874
Savannah Electric and Power Company	892,555
South Carolina Electric & Gas Company	6,946,769
Southern California Edison Company	23,505,249
Texas-New Mexico Power Company	1,202,988
Westar Energy, Inc.	3,805,247
Wisconsin Power and Light Company	2,604,743
Wisconsin Public Service Corporation	2,609,485
Average:	6,992,796

Source: 2005 FERC Form 1 Database



Michele Smart

michele@ethree.com

415 391 5100 ext. 305

ENERGY & ENVIRONMENTAL ECONOMICS, INC.

Senior Consultant

San Francisco, CA

2006 - present

Michele specializes in energy finance. Her responsibilities at E3 include asset valuation, mergers and acquisitions, shareholder value, cost of capital, and cost of service studies.

CALPINE CORPORATION

Finance Manager

Dublin, CA

2003-2006

- Led, structured and closed \$100 million non-recourse financing for 600 MW power plant. Led teams negotiating Credit Agreement, Construction Management Agreement, Operations and Maintenance Agreement and other structured finance documents. Financing was first single-asset, merchant power plant project financing completed in California after the energy crisis.
- Led \$255 million debt and preferred equity power project refinancing. Negotiated Credit Agreement and Amended and Restated Limited Liability Company Operating Agreement. Negotiated amendments to related project contracts. Assisted with creation of Offering Memorandum.
- Developed analyses supporting regulatory filings, including utility rate base revenue requirements models, cost-based rate schedules, and merchant/utility rate structure comparisons.
- Developed supporting analysis for and participated in PG&E Reliability Must-Run (RMR) contract settlement negotiations.
- Created power plant valuation models with economic dispatch against long-run marginal cost curves for use in property tax negotiations. Presented methodology to California State Board of Equalization to advocate reduction in assessed property tax values. Resulted in substantial reductions to property taxes.
- Prepared short- and long-term economic analyses to screen commercial viability of projects, support commercial negotiations, recommend investment decisions, and examine financing alternatives. Prepared annual FAS144 accounting impairment analyses. Priced and structured PPAs (capacity and energy products) to ensure appropriate risk allocation while meeting economic objectives.

INTERGEN (A BECHTEL-SHELL VENTURE)

Manager

London, England & Boston, MA

1998-2002

- Prepared 5-year corporate business plan forecasts. Implemented standardized valuation and assessment for entire power project portfolio. Identified U.S. acquisition strategy addressing target markets, alliances, technology and business plan objectives. Created presentation for Bechtel-Shell Board of Directors summarizing results. Resulted in selection of acquisitions and divestitures pursued.
- Wrote program updates, development budget requests and equity requests submitted to Board of Directors.
- Managed sale of 1100 MW power plant. Supervised creation of Information Memorandum, organized management presentations, directed creation of equity case financial model, coordinated due diligence process, developed transaction documentation.
- Led securitization of equity interest in 700 MW power project in Mexico. Interfaced with tax, treasury and planning groups to achieve tax, cash and income requirements. Developed solutions to ratings agency and note-holder issues.

Michele Smart resume, p.2

- Led permitting process for Egypt's first IPP (Sidi Krir). Built relationships with authorities to ensure timely receipt of permits. Organized public consultation and disclosure meeting. Supervised production of Environmental Impact Assessment. Obtained all permits required to construct and finance the 680 MW power plant.
- Directed internal and advisors' efforts and led negotiations with consortium of 7 international banks to resolve conditions precedent to Sidi Krir first non-recourse debt draw. Achieved first drawdown on schedule.
- Led negotiations to acquire site option and associated permitting for 800 MW power plant site in Germany. Successfully negotiated all transaction documentation.
- Created economic models with local and US GAAP financial statements for power projects in Europe and the Middle East. Worked closely with team members to ensure proper treatment of capital cost, accounting, tax, finance, engineering, O&M, fuel, and market forecast assumptions. Evaluated non-recourse finance structures and impact on equity return. Optimized income and cash flow.

NEWCOMB ANDERSON ASSOCIATES (EMCOR Group)

Assistant to Principals

San Francisco, CA

1995-1996

- Developed responses to RFPs for energy efficiency engineering services.

EDUCATION

University of Chicago, Graduate School of Business

M.B.A., Concentrations in Finance and Economics
LEAD IX Facilitator, member of Oil and Energy Group

University of California, Berkeley

B.A., Mathematics and Middle Eastern Studies
Foreign Language and Area Studies (FLAS) Scholarship

CITIZENSHIP

United States

Ronald C. Warrington

Education

HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION
Master in Business Administration

BOSTON, MA

UNIVERSITY OF CALIFORNIA AT BERKELEY
Bachelor of Arts in Economics (Honors)

BERKELEY, CA

Professional Training

CHASE MANHATTAN BANK, N.A.
Executive (Credit) Development Program

NEW YORK, NY

Professional Experience

E3, INC.
Senior Partner

SAN FRANCISCO, CA
1997 - Present

Mr. Warrington's practice area focuses on finance, procurement and business strategy in both the utility and competitive electricity markets. He has advised some of North America's largest utilities and independent power marketers on competitive market opportunities and regulation as well as risk management and finance. Engagements have included creation of business plans, evaluation of merger & acquisition opportunities as well as hands on advisory work on operational and implementation issues. Ontario, Canada efforts include support for a Newmarket Hydro, Falconbridge, AMPCO, Ontario Power Generation, York Region School Board and the Upper Canada Energy Alliance among others. Representative engagements include:

- Advisor to NYSE CEO on business, finance and regulatory strategy for operations of \$3 Billion Fortune 500 utility. Facilitated annual Board of Directors retreat and delivered findings and corporate strategy
- Drafted analysis and provided support for a large California IOU filing related to Assembly Bill 57 – portfolio risk management compliance requirements
- Advised California Public Utilities Commission on cost of capital component for use in the development of the Market Price Referent – part of the California Avoided Cost study
- Led member general managers with Upper Canada Energy Alliance through strategic and analytic review of regulated and competitive business options during market transition period, resulting in creation of jointly owned IT service company
- Created and delivered series of educational market seminars for Ontario on behalf of Ontario Power Generation – earning presidential award for impact on customer satisfaction
- Advised AMPCO and provided information to the Ministry of Finance on administrative structures of North American Energy Efficiency Programs
- Reviewed and provided Opinions regarding the value of Ontario local distribution utilities 1998 through 2006
- Reviewed nuclear, hydro and must-run generation capital budgeting process for large Western utility, presenting findings to senior management
- Researched and delivered findings on utility shareholder incentive mechanisms for demand side management programs in North America
- Developed business plans for unregulated energy services subsidiaries of US and Canadian utilities
- Assisted management and shareholder in the structure and design of an independent Board of Directors for previously wholly regulated utility. Guided Board through successful development of corporate strategy and development of M&A strategy
- Drafted regulatory filing and business case for \$20 million customer information system (CIS)
- Advise commercial/industrial customers on energy sale and procurement strategies, including RFP support, contract development and risk management methods. Led Ontario's largest energy customer through development of electricity portfolio, market strategy, supplier selection and negotiations

- Conceived and developed energy procurement practice including development of real-time, Internet-based auction system and software, related legal contracts as well as supporting materials. This service has procured over \$300 million in energy on behalf of clients and provided portfolio risk management services related to volatility in energy markets

Other work with clients involves asset valuation, strategy review and regulatory support in the face of market deregulation. Clients have included PG&E, Pacific Bell/SBC Communications, American Electric Power, Hawaiian Electric, the Shorenstein Company, Los Angeles Unified School District, Newmarket Hydro (and Upper Canada Energy Alliance), Ontario Power Generation, Falconbridge Limited (Noranda Inc.), and C3 Communications, as well as others.

COMMUNICATIONS CENTRAL, INC.
Board of Directors

ATLANTA, GA
1993 – 1998

Part of the management team prior to the Initial Public Offering. CCI (listed as NASDAQ: CCIX) was the surviving company of a merger with U.S. Public Communications (see below). At over \$110 million in revenues, it was among the nation's three largest independent providers of public communications equipment and services. Sat on the Board as an experienced operating manager, providing guidance to the company through a complex management and market transition. Worked closely with the venture investors to stabilize the company's operations after a management issue drove the stock down to \$4.50/share. In association with another investor/board member, recruited new management and developed the exit strategy that improved the stock from its low of \$4.50/share to its acquisition price of \$10.65 per share in less than two years.

NEW HEALTH VENTURES
Principal

BOSTON, MA
1995 – 1997

Founding principal of captive venture capital arm of Blue Cross Blue Shield of Massachusetts (BCBSMA). Invested in early stage ventures in the health care industry. Leveraged in-house medical expertise, insurance information, and relationships into investments in health care businesses that benefited the company. Investment positions included MDI Instruments (an otitis media medical device); Avicenna (an early on-line medical database); Proxymed (NASDAQ: PILL, a physician/pharmacy software company); and Healthon (now WebMD). Worked closely with staff doctors, technical experts and partners to identify and evaluate opportunities. Performed due diligence, negotiated term sheets and structured equity participation arrangements. Also, as part of the initial organization effort, developed processes, databases and systems to monitor group investments. Recommended investment opportunities to co-principals and Blue Cross CEO.

THE INDEX GROUP (COMPUTER SCIENCE CORPORATION)
Senior Consultant

CAMBRIDGE, MA
1993 – 1995

Served as advisor to Fortune 500 clients on strategy, finance, new business development, customer service, and business process reengineering within their organizations. Lead numerous client teams through process redesign and strategy development engagements on a range of issues:

- Initiated, evaluated and developed multi-million dollar financial business plan for leading New York investment bank in the home mortgage market
- Analyzed sales initiation to delivery process, created new strategic vision, and developed multi-million dollar business case for an international company. Led client team through detailed redesign and implementation of their most successful technology implementation effort to date - worldwide.
- Managed a client team which analyzed and evaluated the customer technical service processes of four major lines of business in five world markets for a complex multinational telecommunications equipment supplier
- Developed a strategic vision and recommended methods of improving customer satisfaction, while reducing costs and response time for customer service organizations
- Index company expert on best practices in new product and business development which grew into a primary practice area of the firm

Clients included *General Electric, Bayer Chemicals, Northern Telecom as well as others*. The Index Group founded the concept of business process reengineering through Reengineering the Corporation by James Champy (CEO) and Michael Hammer.

U.S. PUBLIC COMMUNICATIONS, INC.
President and Chief Operating Officer

BIRMINGHAM, AL
1990-1991

Invested in company during start-up phase, joined as President & COO in 1990. Recruited new CEO and key supporting personnel to turn around operations. Grew sales from \$900K in 1988 to \$11 million by 1991. Merged the company in 1991

with Communications Central, Inc. to form one of the three largest independent public communications companies in North America.

- Managed daily operations of line managers and employees in 14 states for the region's second largest independent public communications company.
- Planned and implemented asset redeployment schedule more than doubling revenues.
- Achieved and sustained substantial reductions in annual operating expenses.
- Implemented new management information system monitoring cash and long distance usage

WDC, INC

BIRMINGHAM, AL

Chief Financial Officer

1987-1990

Responsible for daily management and operations of over \$30 million in investments, joint ventures, and going concerns. Sourced new deals, negotiated loans and investments and managed due diligence as well as restructured \$6 million in previously troubled assets. Extensive experience with emerging business finance, management, and investment.

- Developed multi-million dollar entertainment complex on the Gulf Coast. Managed and oversaw operations of company with 195 seasonal employees. Developed successful add-on business with 6-month payback
- Formed a telecommunications leasing company with over \$6 million in total assets. Developed systems used to monitor several thousand leased terminals
- Negotiated purchase and subsequent sale of \$8 million office warehouse facility
- Managed 238 acre site development (sold out six months ahead of plan)

CHASE MANHATTAN BANK, N.A

NEW YORK, NY

Relationship Manager (Bank Officer)

1983-1987

Managed a portfolio of \$250 million in loan commitments to New York clients. Clients included some of the largest developers in New York City..

Financial Analyst (Assistant Treasurer)

Worked in the Financial Analysis/Workout Division as part of lead bank team for restructurings valued in excess of \$600 million – clients included oil refineries/retail outlets, real estate and international transportation. Managed multi-million dollar equity securities portfolio, making senior level recommendations directly to the Chief Financial Officer regarding equity valuations and sell/hold positions.

Publications

Lloyd, D., C.K. Woo, M. Borden, R. Warrington and C. Baskette (2004) “*Competitive Procurement and Internet-based Auction: Electricity Capacity Option*,” Electricity Journal, forthcoming.

Woo, C.K., D. Lloyd, M. Borden, R. Warrington and C. Baskette (2004) “*A Robust Internet-Based Auction to Procure Electricity Forwards*,” Energy - The International Journal, 29:1, 1-11.

Woo, C.K., M. Borden, R. Warrington and W. Cheng (2003) “*Avoiding Overpriced Risk Management: Exploring the Cyber Auction Alternative*,” Public Utilities Fortnightly, 141:2, 30-37.