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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD
Before Administrative Judges
James P. Gleason, Chair
Frederick J. Shon
Dr. Oscar H. Paris

In the Matter of:	
CONSOLIDATED EDISON COMPANY OF NEW YORK INC. (Indian Point, Unit No. 2),	Docket Nos. 50-247 SP
POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point, Unit No. 3)	50-286 SP
	April 8, 1983

Testimony Submitted of Behalf of
"New York City Council" Intervenors

By

Dr. Barry Commoner and Mr. Richard Schrader

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1.0 INTRODUCTION

These Hearings are concerned with a petition to close Indian Point nuclear power units II and III. One of the issues raised by this petition is whether the demand for electricity-powered services normally met by these units can be met in some other ways if they are shut down. This testimony is concerned with this issue. In what follows, we propose specific steps which can be taken to eliminate the need for the power produced by Indian Point units II and III.

It is our proposal that instead of operating Indian Point II and III, Con Edison and PASNY institute a program of energy conservation, based on accelerated replacement of present appliances with energy-efficient ones and on the introduction of decentralized power production by small-scale cogenerators. We propose to show that these measures can eliminate the need for the power that Indian Point II and III are expected to supply and that they are economically advantageous as well. We contend that Con Ed and PASNY can make better use of their financial capabilities by supporting such a program of energy conservation than by operating Indian Point II and III.

2.0 ELIMINATION OF THE NEED FOR POWER FROM INDIAN POINT II

2.1 The Problem

Indian Point II represents a nominal capacity of 873 MW. Over its life it has operated at an average capacity factor of 50 percent[1]; this performance level may be expected to continue.

At that capacity factor, Indian Point II provides its service area, New York City and Westchester, with 3.8 billion kwh per year. In what follows we show how it is possible to eliminate the need for this source of power.

2.2 Opportunities for Power Conservation

Power conservation can be achieved by replacing current appliances with models which achieve the same output at a lower level of power consumption. The appliances which account for 1935 kwh out of a typical household consumption of 3309 kwh, or 58% of the residential power consumption in the Indian Point II service area, are refrigerators, air conditioners, and light bulbs, used in the residential and commercial sectors. Data regarding the average power consumption by the appliances now in use and market saturation levels, available from the 1981 Long Range Plan Report of Member Systems of the New York Power Pool are shown in Table 1. According to the New York Power Pool Report,[2] residential refrigerators have an average lifetime of 16 years, and air conditioners have an average lifetime of about 12 years, so that about 33 percent and 50 percent respectively are replaced in a five-year period. Light bulbs are replaced in about one year for residential use and six months for commercial use. In the calculations which follow we assume that 75 percent of these residential appliances and 50 percent of commercial lighting units will be replaced with more efficient ones over a five-year period.

Table 1

	Average Power Consumption (kwh/year)	Saturation	Average Power Consumption Per Household (kwh/year)
Refrigerator	900	102%	918
Air conditioner (room)	419	98%	408
Lighting	609	100%	609
		TOTAL	1935

Long Range Plan, Vol. 1 (1981)
New York Power Pool

2.3 Residential Refrigeration

In 1985, the Company (Con Ed) forecasts that there will be 1.46 million self-defrost refrigerators and 1.69 million manual defrost units in residential use in its service area. The self-defrost units will have a coincident use of 38 percent, while the manual units will have a coincident use of 36 percent. The resulting combined coincident peak summer demand will be 443 MW,[3] which represents 19.6 percent of the residential summer peak demand of 2260 MW.

According to the Company, in 1985 residential refrigerator models are expected to have an average usage of 900 kwh/unit. However, Amana is currently marketing a 14-cubic-foot energy-saver model that uses 600 kwh/year.[4] Thus, this model would reduce the Company's estimate of power consumption for residential refrigerators by 33 percent.

Accordingly, we can compute the potential reduction in power consumption by residential refrigeration as follows, on the assumption that 75 percent of the present stock is replaced by units that are 33 percent more efficient:

(1) $3.154 \times .75 \times 10^6$ units = 2.358×10^6 units (number of potential high efficiency units)

(2) 900 kwh x .33 = 297 kwh (saving/unit)

(3) $2.358 \times 10^6 \times 297 = 700 \times 10^6$ kwh (total saving)

Thus, the replacement of 2.36 million residential refrigerators by more efficient units will achieve a savings of 700 million kwh in energy requirements and, at 33% reduced usage, a lowering of 110 MW in peak power.

2.4 Residential Air Conditioners

As indicated in Table 1, in 1985 room air conditioner units are expected to use, on average, 419 kwh/year. Given the 98% saturation level for room air conditioners, the 3,067,000 households within the Company's service area operate a total of 3.01 million residential room air conditioners. However, higher electric rates and New York State's promulgation of efficiency standards have broadened the market for high-efficiency units. According to Carrier Corporation,[5] the average EER* for the current stock of residential air conditioners in New York State is 7.75. However, according to a City Energy Office report,[6] models with an EER of 10 are available. Accordingly, if 75% of the residential room air conditioners currently attaining an EER of 7.75 were replaced by units with an EER of 10, the resulting power savings can be computed as follows:

(1) $.75 \times 3.01 \times 10^6$ units = 2.26×10^6 units (number of potential high efficiency units)

(2) 419 kwh x .225 = 94.3 kwh (saving/unit)

(3) $2.26 \times 10^6 \times 94.3 = 213 \times 10^6$ kwh (total saved)

The replacement of 2.26 million air conditioners with units of efficiency measured at 10 EER will result in a savings of 213.2 million kwh. Room air conditioners will contribute 1330 MW to summer peak demand in 1985, or 58.8 percent of a residential peak of 2260 MW. A 22.5% decrease in peak would create a reduction of 300 MW of peak demand.

*EER is defined as the ratio of the number of BTU's of heat removed per hour by the air conditioner to the number of watts used per hour.

2.5 Residential Lighting

As indicated in Table 1, the average household in the Company service area uses 609 kwh/year for lighting, so that the 3.067 million households in the service area use 1.868 billion kwh/year for lighting. According to the City Energy Office,[7] new energy-efficient light bulbs reduce the amount of electricity consumed by a typical 100-watt incandescent bulb by 60 percent. General Electric and Duro Test now have such bulbs in production.[8]

If 75% of the lighting units in the Company service area were replaced by the more efficient bulbs, assuming the replacement of only the oldest bulb per household, we can compute the resulting power savings as follows:

(1) 3.067×10^6 households $\times .75 = 2.3 \times 10^6$ (number of potential high efficiency units)

(2) 609 kwh $\times .6 = 365$ kwh (saving/unit)

(3) $2.3 \times 10^6 \times 365 = 840 \times 10^6$ kwh (total saved)

2.6 Total Power Savings

As indicated in Table 2, the replacement of the present stock of appliances with energy saving models as described above would reduce power use by Con Ed's residential customers by 1.8 billion kwh. Conservation investments in the commercial sector will provide another source of energy savings. In New York City, according to the City Energy Office report,[7] cooling and lighting in the commercial sector account for 13.34 trillion BTU or 3.9 billion kwh.[9] That report estimates that conservation measures could reduce power consumption by the commercial sector by a minimum of 31%.

Table 2

Appliance	% Replaced	Total KWH Saved
Refrigerator	75	700×10^6 kwh
Residential A/C	75	213.2×10^6 kwh
Residential Lighting	75	841×10^6 kwh

If these savings were 50 percent, a figure which could reasonably be achieved,* they would amount to 2.0 billion kwh, which, together with the residential savings outlined above, would eliminate the need for Indian Point II. Alternatively, if we accept the City Energy Office's minimum savings of 31%, the remaining savings required to eliminate the need for Indian Point II (about 700 million kwh) could be achieved (see below) by installing cogeneration in about 3500 50-unit residences in New York City. As a third alternative, 700 million kwh could be provided by increasing the power supplied by Canadian hydropower services. (Con Edison currently receives nearly 800 MW of firm power from Hydro Quebec and Hydro Ontario, obtaining some 3 billion kwh of energy through those contracts annually.[10] Canadian authorities have indicated that additional power is available[11] and its purchase by Con Edison can be authorized by the New York State Power Pool and state regulators.)

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* It has been estimated by Mr. Cliff Ahrens of Business Energy Investments (via a telephone interview) that energy-conserving replacements in the commercial sector have a payback of about two years.

2.7 Meeting the Costs of Power-saving Measures

The Home Insulation Energy Conservation Act (HIECA) has sought to create a financing mechanism in which homeowners of up to four-family buildings can obtain low-interest loans from utilities to invest in a variety of conservation measures. Rather than providing a direct loan to property owners, investor-owned utilities guarantee a portion or all of a loan made by a local financial institution. Utilities first perform energy audits on buildings whose owners request them. If a homeowner wishes to make conservation investments, the utility will subcontract the work out and provide a loan up to $4500 for a four-family house at roughly 11.5 to 12% interest. The utility therefore subsidizes a portion of the loan to homeowners, leveraging its credit to back up the bank loan by providing an interest rate tied to its rate of return. Currently, multi-family buildings and commercial units are unable to borrow through HIECA. An amendment to the original legislation was introduced in the last session of the state legislature to expand the purview of the program to both these large groups of building owners.

HIECA can provide the financing vehicle for a five-year program of accelerated appliance replacement. Two further additions to the existing law would facilitate financing the replacement strategy:

1) The Power Authority should be included on some level of financing. Legislation has been introduced in the state

legislature in the past year to include PASNY in the HIECA program. The Power Authority, through an issuance of revenue bonds, could commit a portion of their resources to conservation, particularly when that conservation will lower overall energy requirements in the region.

2) Con Edison should be allowed to place in their rate base, thereby gaining a guaranteed return on their investment, any capital loaned to consumers for the purpose of conservation, if that loan will purchase equipment or material that directly lowers the building owner's consumption of electricity.

These amendments to the existing program will create a broader financing base from which investment capital can be drawn for appliance replacement.

The time frame for the appliance replacement plan should be streamlined to five years and begun within the next year. The overall number of targeted appliances is quite large: 2.36 million refrigerators, 2.26 million residential air conditioners, and 2.3 million residential lighting units. The average mean lifetime for a refrigerator in the Con Ed franchise area, according to the New York Power Pool, is 16 years, for an air conditioner 12 years,[12] and according to General Electric, one year for residential light bulbs.[13] In the five-year replacement scenario, therefore, a refrigerator will be replaced through one-third of its typical cycle. The energy efficient model is currently priced at $637, some $100 above a typical General Electric 14-cubic-foot unit,

which now sells for $545.[14] For a typical unit using 300 kwh less energy a year, with Con Edison's projected rate increase, a five-year savings would be, if begun in 1985,

	Con Ed Rates ¢/kwh	Consumer $ Savings
1985	18.19	54.60
1986	19.67	59.01
1987	21.15	63.45
1988	22.63	67.89
1989	24.11	72.33

for a five-year $320 total savings. If we assume that each unit carries an embedded value equalling two-thirds of its original cost, and if the purchase price of the unit is discounted by 10% to account for inflation, then the salvage value of that unit would be $335 ($500 x .67). The total cost of the change is then $435, which represents a payback of seven years, taking into account the expected increase in Con Ed rates after 1990.

A residential room air conditioner unit, with a mean lifetime of 12 years, would experience half its life cycle during the five-year replacement schedule. According to local retailers, the difference in cost between a unit with an EER of 7.5 to 7.75 and an EER of 10 is approximately $100.[15] A five-year schedule of savings at 22.5% less usage would achieve annually

	Con Ed Rates ¢/kwh	Consumer $ Savings
1985	18.19	17.15
1986	19.67	18.54
1987	21.15	20.00
1988	22.63	21.34
1989	24.11	22.73

for a $100 savings in five years. The unit will have an embedded cost of half its total life cycle on a purchase price of $350.[16]

If we assume that the purchase price of the unit is reduced by 10% to account for inflation, then the original selling price would have been $315. Based on one-half of this original price plus the $100 cost differential between conventional and energy-efficient units, and taking into account expected increases in rates beyond 1990, we can expect a 10-12 year payback for this investment.

The Duro Test residential light bulb calculations project a savings, for one bulb, on a 90-watt ATC watt-saver, in place of conventional incandescents, of $6.65 over the 4500-hour life of the model, roughly a year of usage.[17] At an added bulb price of 75¢ to $1.00, this achieves a payback of two months at 12 hours' use a day.

Based on these considerations, the total cost of a residential appliance replacement program can be computed as follows. The additional cost for the energy efficient refrigerator unit of $435, applied to the replacement of 2.36 million units, represents a total cost of $1.03 billion. The additional cost of an energy efficient air conditioner, of $258 per unit applied to the replacement of 2.26 million units, represents a total cost of $583 million. The additional cost of energy efficient light bulbs of $1.00, applied to the replacement of 2.3 million units per year, over a five-year period, amounts to a cost of $11.5 million. Thus, the total replacement plan for residential conservation will cost $1.61 billion, and would save about $380 million in power costs over the five-year period. We believe that this would justify financing the program through HIECA, especially if PASNY were included and

Con Ed were allowed to include the necessary investment in its rate base. If the Indian Point plants were permanently closed by 1985, the appliance replacement schedule could coincide with that retirement.

3.0 ELIMINATION OF THE NEED FOR POWER FROM INDIAN POINT III

3.1 The Problem

Indian Point III represents a nominal capacity of 965 MW. Over its life, it has operated at an average capacity of 50%;[18] this performance may be expected to continue. The plant is owned and operated by the Power Authority of the State of New York (PASNY) and provides service for New York City and Westchester public buildings, street lighting, the MTA subway and train system, the World Trade Center, and a substantial portion of public housing units. The total electricity output from this plant is 4.2 billion kwh/year.

3.2 Opportunities for Cogeneration Applications

Cogeneration is a technique for utilizing the heat rejected during the electricity production process. Typically, this heat is used as a low-pressure industrial process steam, space heat for buildings, or hot water for residential use. Economic savings can be substantial due to the fuel savings and reduced capital requirements of a cogenerator compared with conventional centralized power plants. It is our contention that the power supplied by Indian Point III can be replaced by installing cost-effective

cogenerators in residential buildings.

We shall use as an example of a typical cogenerator suitable for use in a number of typical New York City buildings, a unit manufactured by the Fiat Company, the TOTEM. Its electrical output is 15 kw with a thermal output of .13 MMBtu per hour. It is operated on natural gas, consuming 215 cubic feet per hour. Maintenance costs run on average 40¢ per hour.

Operating year-round, at 95 percent capacity, to allow for down-time and overhaul, a TOTEM cogenerator will produce 97,200 kwh of electricity per year. Hence, if 43,200 of such devices, or their equivalent, were installed in multi-family buildings in New York City and Westchester County, these decentralized plants could replace the 4.2 billion kwh now produced by Indian Point III.

These cogenerators might be distributed and operated so as to meet the base thermal demand, namely, the year-round domestic hot water load, of these buildings (the existing system provides backup). In this case, there would be one TOTEM for each 25 apartment units, that is, the equipment replacing Indian Point III would serve 43,200 x 25 = 1.1 million apartment units. (There are approximately 1.9 million apartment units in New York City, and 2.155 million units in the full Con Edison service area.) They might, of course, be distributed and operated in other modes as well.

Continuing to use the TOTEM cogenerator as our example, the equipment which would replace the output of Indian Point III, amounting to 43,200 TOTEMS or their equivalent, would cost approximately $580 million. We estimate that they would pay for themselves

in electrical savings in less than 2.5 years, so they would be a good investment for those many apartment owners who would choose, with the assistance and stimulus of City and State officials, to install such equipment.

4.0 CONCLUSIONS

Based on the foregoing considerations, we conclude that if, in view of the unresolved hazards associated with the operation of the Indian Point II and III nuclear power plants, a decision is made to shut them down, there are feasible ways of reducing the electrical demand of the service area which these plants serve so they are no longer needed. These means include accelerated replacement of present appliances with energy-conserving models and the installation of decentralized cogenerator power plants in a portion of the multiple family residences in the service area.

##

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4. "The Potential of Energy Efficient Refrigerators for Peak Power and Energy Conservation in New York City," New York City Energy Office, Feb. 1980, p. 2

5. Carrier Corporation, company representative telephone interview, 4/11/83

6. "The Potential of Energy Efficient Room Air Conditioners for Peak Power and Energy Conservation in New York City," N.Y. City Energy Office, Feb. 1980, p. 2

7. "Potential Savings by the Use of Energy Efficient Light Bulbs in Homes and Apartments," N.Y. City Energy Office, Feb. 1980, p.1

8. Troxell, Thomas Jr., "In a New Light: Duro Test's Longer Lasting Bulbs," Barrons, Oct. 13, 1980

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9. Energy Consumption in New York City: Patterns and Opportunities, Phase 1. New York City Energy Office, Table 5, p. 25

10. "Report of Member Electric Systems of New York Power Pool," p. 12

11. Holmes, Peter, "Peddling Canadian Power," Fortune, Sept. 20, 1982

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14. ELS Refrigeration, company representative telephone interview, 4/9/83

15. J&L Air Conditioning and Refrigeration Company, company representative telephone interview, 4/4/83

16. Ref. 15

17. Duro Test Corp., company representative, telephone interview 3/20/83; sale literature, 1983

18. Ref. 1

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Birth date: May 28, 1917
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Citizenship: United States

EDUCATION

1937	AB Columbia College (Zoology, with honors)
1938	MA Harvard (Biology)
1941	Ph.D. Harvard (Biology)

HONORS

1936	Phi Beta Kappa
1953	Newcomb Cleveland Prize, AAAS
1963	D.Sc. Hahnemann Medical College
1967	LL.D. University of California
1968	D.Sc. Grinnell College
1969	D.Sc. Lehigh University
1970	First International Humanist Award, International Humanist and Ethical Union
1970	D.Sc. Williams College
1971	D.Sc. Ripon College
1972	Phi Beta Kappa Award for The Closing Circle
1972	D.Sc. Colgate University
1973	International Prize for Safeguarding the Environment, from the City of Cervia, Italy, for The Closing Circle
1974	D.Sc. Clark University
1977	Commander in the Order of the Merit of the Republic of Italy
1978	Premio Iglesias (Sardinia, Italy) for The Poverty of Power
1979	American Institute of Architects Medal
1980	D.Sc. Cleveland State University
1981	LL.D. Grinnell College
1982	Premio Iglesias (Sardinia, Italy) for The Politics of Energy

RESEARCH AND TEACHING

1981-	Director, Center for the Biology of Natural Systems, Queens College, CUNY
1981-	Professor, Department of Earth & Environmental Science, Queens College, CUNY
1981-	Visiting Professor of Community Health, Albert Einstein College of Medicine
1976-81	University Professor of Environmental Science, Washington University
1965-81	Director, Center for the Biology of Natural Systems, Washington University

RESEARCH AND TEACHING (cont'd)

1965-69 Chair, Department of Botany, Washington University
1953-76 Professor of Plant Physiology, Washington University
1947-53 Associate Professor of Plant Physiology, Washington University
1946-47 Associate Editor, Science Illustrated
1942-46 Lieutenant, U.S. Naval Reserve, active duty
1940-42 Instructor, Queens College, CUNY
1938-40 Assistant in Biology, Harvard University

SCIENTISTS' INSTITUTE FOR PUBLIC INFORMATION ACTIVITIES

1963-80 Board of Directors
1967-69 Co-chair, Board of Directors
1969-78 Chair, Board of Directors
1974 Co-chair, Convocation on The Energy Outlook and Global Interdependence
1975-80 Co-chair, Steering Committee, Emergency Task Force on Energy Options
1978 Chair, Executive Committee
1979 Vice-chair, Board of Directors

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE ACTIVITIES

1954-60 Secretary, Botanical Section
1960-61 Chair, Botanical Section
1954-60 Chair, Committee on AAAS Research Grants
1956 Member, Committee on Social Aspects of Science
1956-61 Member, Committee on Popular Books in Science
1958 Steering Committee, AAAS Parliament on Science
1958-65 Chair, Committee on Science in the Promotion of Human Welfare
1965-69 Member, Committee on Council Affairs
1967-74 Member, Board of Directors
1968-74 Member, Executive Committee of Board of Directors
1968-74 Member, AAAS Committee on Environmental Alterations
1969-74 Chair, AAAS Committee on Environmental Alterations

OTHER ACTIVITIES

St. Louis Committee for Environmental Information (Board of Directors 1958-80; President 1965-66)
Society of General Physiologists, Council Member 1961
American Institute of Biological Science, Governing Board 1965-67
National Parks Association, Board of Directors 1968-
American Chemical Society
American Society of Plant Physiologists
American Society of Biological Chemists
Ecological Society of America
Sigma Xi, Chapter President 1957-58
American Association of University Professors, Chapter President 1959-60
International Environmental Institute, Cervia, Italy, President 1982-

EDITORIAL BOARDS

International Review of Cytology, 1957-65
Problems of Virology, 1956-60
American Naturalist, 1959-63
Theoretical Biology, 1960-64
Science Year, 1967-72
The World Book Encyclopedia, 1968-73
Environmental Pollution, 1969-79
National Wildlife, 1970-
Chemosphere, Editorial Advisory Board, Honorary Member, 1972-77
In These Times, Board of Sponsors, 1976-
Environment Magazine, 1977-
Bulletin of Science, Technology and Society, 1980-

ADVISORY BOARDS

Rachel Carson Trust for the Living Environment, Board of Consulting Experts, 1967-
National Tuberculosis Association, Commission on Air Conservation, 1966-68
U.S. Dept. of the Interior, Special Study Group on the Sonic Boom, 1967-68
University of Oklahoma, Law Center Commission, 1969-70
Universities National Anti-war Fund, Member of Board
Chaim Weizmann Centenary Celebration, International Sponsoring Committee, 1974-75
Coalition for Health of Communities, Advisory Committee, 1975-
U.S. Dept. of Commerce, Secretary's Advisory Council, 1976
Center for Development Policy, Advisory Committee, 1978
The Fund for Peace, Council of Advisors, 1978
Scientific Advisor, New York State Legislative Commission on Science and Technology, 1981-

RESEARCH ACTIVITIES - CURRENT

1) The origins and significance of the environmental and energy crises, especially in relation to transformations of production technology, and their economic consequences;
2) Environmental carcinogenesis; development of methodology, based on bacterial mutagenesis, for the rapid detection and identification of synthetic organic carcinogens in environmental samples;
3) Development of strategies to facilitate the production of food and fuel by United States agriculture;
4) Design of cost-effective cogenerator-based energy systems for residential buildings;
5) Development of biological strategies for the cost-effective conversion of municipal solid waste to fuel;
6) Development of strategies for the reorganization of nearby agricultural areas to facilitate entry into municipal food markets.

RESEARCH ACTIVITIES - PAST

1) Investigations of cellular metabolism (at Harvard University and Queens College);
2) Development of emergency breathing procedure for high altitudes; research in aviation physiology; aircraft dispersal of insecticides (U.S. Navy, 1942-46);
3) Microspectrophotometric studies of single cells (at Washington University);
4) The mechanism of tobacco mosaic virus replication (at Washington University);
5) The development of new diagnostic techniques, in medicine and surgery, based on electron spin resonance spectrometry (at Washington University);
6) The chemical basis of inheritance; evaluation of current theories; experimental studies of the roles of DNA in the inheritance of basic species characteristics, especially in relation to environmental adaptation (at Washington University);
7) Analysis of the current status of the nitrogen cycle, especially by means of nitrogen-15 fractionation studies (at Washington University);
8) Elucidation of the roles of free radicals in biological processes (carcinogenesis, effects of ionizing radiation, metabolism) by means of electron spin resonance spectrometry (at Washington University).

BOOKS PUBLISHED

1966 Science and Survival, New York: The Viking Press
1971 The Closing Circle, New York: Alfred A. Knopf, Inc.
1973 La Technologia del Profitto, Rome: Editori Riuniti
1976 The Poverty of Power, New York: Alfred A. Knopf, Inc.
1976 with Virginia Bettini: Ecologia e Lotte Sociali, Milan: Feltrinelli
1978 l'energia alternativa, Rome: Editori Riuniti
1979 The Politics of Energy, New York: Alfred A. Knopf, Inc.

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EDUCATION

Boston University Graduate School of Public Communications
M.S. in Journalism; Minor in Economics - 1976

Fordham University
B.A. (Magna Cum Laude) - 1973

EMPLOYMENT

May 1982 - Present
Research Associate, Center for the Biology of Natural Systems, Queens College

* Authored report on financing options for building owners who will invest in energy conservation measures.

* Co-authored report on building tracts and thermal characteristics of New York City's housing stock.

* Participated in project to design a cogeneration system for the Bronx Zoo, responsible primarily for environmental impacts and legal implications of the technology.

* Director of the CBNS education program, which involved monthly workshops with community organizations throughout New York City; the workshops used a computer program to provide detailed savings schedule for a variety of conservation measures as well as a seminar on financing strategies.

September 1979 - April 1982
Energy Director, New York Statewide Senior Action Council

* Intervened in Consolidated Edison rate cases before the Public Service Commission (PSC); prepared testimony and briefs on capital structure, fuel procurement and excess generating capacity.

* Presented evidence before Environmental Protection Agency (EPA) during Con Ed coal conversion proceedings in coordination with Queens Community Planning Boards 1, 2, and 3.

* Participated formally in the New York State Master Energy Plan on the feasibility of hydropower and resource recovery as available fuel options.

* Organized outreach project to 125 senior cetners in 8 counties, describing federal and state energy assistance programs and cold weather utility regulations.

* Supervised staff of six in emergency crisis assistance to prevent the termination of electric and gas service for low-income consumers.

* Wrote successful grants to Department of Energy, Community Services Administration and the New York State Consumer Protection Board for the prevention of hypothermia and the mobilization of seniors in the utility rate-making process.

* Co-host of twice monthly radio show on Energy and the Environment on WBAI.

* Contributed monthly column on energy and housing to Senior Action; regular contributor to Alternate Currents, WIN magazine, City Limits and Whole Life Times.

September 1976 to September 1979
Research Director, United Church of Christ -- United Methodist Church Energy Council

* Authored studies and monographs on jobs and conservation in New York State, the restructuring of the New York PSC and a publicly-owned electric system in New York City.

* Supervised team of researchers in comprehensive study examining impact of energy costs on population dependent on public assistance.

* Organized People Outraged With Energy Rates (POWER), a city-wide coalition of 55 labor, religious, senior, environmental and civic groups to contest electric and gas rate increases, design responsible rate structures, assist low-income consumers and investigare alternative energy options.

* Organized forums and rallies on energy and environmental issues for trade union, including a Public Power conference for D.C. 37, the Big Oil Day demonstrations for U.A.W., District 65 and I.A.M. and the energy componentof the Big Business Day conference in New York City for the C.W.A.

* Legislative representative in Albany for United Church of Christ - United Methodist Church Energy Council and New York People Outraged With Energy Rates.

* Conducted monthly seminars for the New York Council of Churches, Riverside Church and the Brooklyn Council of Churches on energy efficiency, particularly insulation and lighting standards.

* Trained staff of Community Service Administration and upstate Community Action Agencies in natural gas pricing policies and the structure of the PSC.

* Guest speaker on energy and environmental topics for numerous civic groups, professional societies and trade union halls throughout the country.

ACADEMIC PRESENTATIONS

* Hofstra University -- a series of five lectures on Energy and Environmental Law.

* New York University School of Metropolitan Studies -- a series of four lectures on Urban Planning and Energy Issues.

* Columbia University School of Law -- Utility Condemnation Law.

* Fordham University -- a series of four lectures on Energy and the Elderly; Social Policy and Economic Dislocation.

* Iona College -- The Structure of Utility Regulation.

* University of Pittsburgh -- The Future of Public Power.

* Boston University Law School -- a series of three lectures on the Implications of the National Energy Act.

* Syracuse University -- Utility Capital Structure and the Consumer.

TESTIMONIES BEFORE REGULATORY AND LEGISLATIVE BODIES

* House Committee on Aging - "Home Energy Assistance Plan."

* House Committee on Energy and Power - Creating a market for small producers of electricity.

* New York State Assembly Committee on Corporations - Price structures for cogenerators.

* New York City Public Utility Review Board - Con Ed's financial condition from 1975 - 1981; bonding powers of the Power Authority of the State of New York; cogeneration.

* New York State Energy Office - Prospects for resource recovery systems in New York City.

* New York City Council Economic and Development Committee - Public Power in New York.

* New Hampshire Public Utility Commission - Creation of New Hampshire Public Power Authority.

* Massachussetts Deparment of Public Utilities - Inquiry into the fuel pass-along.

* New York State Senate Committee on Energy - Production of natural gas from Lake Erie and regarding confirmation of PSC Commissioners.

CONSULTANCIES AND BOARD MEMBERSHIPS

Consultant:	
New York State Consumer Protection Board	1978-1980
Brooklyn Council of Churches	1977-present
New York Department of Law	1978-1979
New York City Public Utility Review Board	1978-1981
U.S. Dept of Energy, Office of Consumer Affairs	1979
Legal Service Corporation	1981
Technical Advisory Committee:	
White House Conference on Aging	1980-1981
Board of Directors:	
Greater New York Council on Energy	1979-present
Public Utility Law Project (PULP)	1979-1980
Alternate Currents Magazine	1979-1980
N.Y. People Outraged With Energy Rates	1977-Present
Member:	
N.Y. Consumer Protection Board Advisory Committee	1978-Present
Governor's Task Force on Toxic Wastes	1978

MEDIA

* Frequent appearances on all major network and local television evening news programs.

* Numerous guest appearances on variety of radio programs on New York City and Albany stations.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

'83 APR 14 A11:29

In the Matter of	)	
	)	
CONSOLICATED EDISON COMPANY	)	Docket Nos. 50-247-SP
OF NEW YORK (Indian Point, Unit 2)	)	50-286-SP
	)	
POWER AUTHORITY OF THE STATE OF	)	
NEW YORK (Indian Point, Unit 3)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Testimony Submitted on Behalf of 'New York City Council' Intervenors" of Barry Commoner and RIchard Schrader in the above captioned proceeding have been served on the following by deposit in the United States Mail, first cl[illegible] this 11th day of April 1983.

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