

B.C.HYDRO IS A MAJOR INSTITUTIONAL FORCE IN
EXTENDING AND INTENSIFYING
STAPLES DEPENDENCE

By

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ABSTRACT

Diversified industrial development was expected in British Columbia with the expansion of the public power supply. But B.C.Hydro, under the direction of the provincial government's industrial policy, produced an "unplanned surplus" of power and intensified British Columbia's dependence on natural resource processing (staples production). Four aspects of this problem are investigated: the provincial state's intervention in the development of hydro power, the use of the hydroelectric infrastructure to extend staples production, the planning for industrial power needs, and the surplus-induced intensification of staples dependence.

Government, B.C.Hydro, and related documents reveal an increased intervention in the relationship between the supply of public hydro power and staples production (from 1945 to 1986). The first intervention emphasized building rural power plants and industrial electrification, the second, mega-dams and "industrialization-by-invitation," and the third, planning to build for export and surplus discounts to industry. Expanding the hydroelectric infrastructure became itself an industry which brought temporary regional, economic, and political benefits. During this period, the infrastructure provided access to natural resources and expanded staples production. B.C.Hydro and the provincial government were

unable to plan industrial loads comprehensively, because of the unreliable commitments by staples producers. Nevertheless, the "surplus and debt-load shock" of the 1980s resulted in discounted electricity to staples producers and an increased dependence on the unstable U.S. electricity market.

The explanatory framework of this thesis draws on staples theory (Innis, Watkins, Marchak) and Offe's theory of state intervention. This thesis is a contribution to understanding the repetition of the historical staples-dependent patterns which resurface in the interventions by the provincial state, as well as a de-mystification of the dreams that the development of public hydro power diversifies the industrial base.

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Chapter I

INTRODUCTION

British Columbia has ample energy resources, such as hydro-power sites in mountainous valleys, and natural resources, such as timber and minerals. One would therefore expect that over 100 years of its settlement, its people would have developed a strong diversified economy. However, the economy of British Columbia has remained a staples-dependent (semi-processed resource dependent) exporting economy. Most natural resources are allocated by the provincial state to private industry for primary processing, and the large hydro power sites at various rivers are developed by the smelting industries and by B.C.Hydro.

This thesis focuses on B.C.Hydro, a central agency in British Columbia since the 1960s when it became a Crown corporation. Its history and practices are pivotal to the development of the provincial economy.

The British Columbia Hydro and Power Authority ("B.C.Hydro") is the fifth largest corporation in Canada in terms of net assets. It was created as a Crown corporation by an Act of the Provincial Legislature on March 30, 1962, as the successor, by amalgamation, of the British Columbia Electric Company Limited and the British Columbia Power Commission which had been the two major suppliers of electricity in the Province of British Columbia prior to that time.¹

1 The B.C. Utilities Commission, *In the Matter of Applications by British Columbia Hydro and Power Authority: Decision*, May 9, 1986, p. 1.

This thesis is concerned with how the development of this corporation has contributed to the strengthening of a staples economy and the lack of economic diversification. This chapter provides the historical background and the analytical approach taken to the problem.

History of the Problem

During the 1940s and 50s, the B.C. Power Commission had appropriated the assets of smaller private utilities to expand its service areas in rural British Columbia and to promote the use of electricity by large natural resource processing companies. During the 1960s and 1970s, the course of hydroelectric development was mapped out by B.C. Hydro and the provincial government following the dual river policy,² which proposed the building of a series of dams on the Columbia and the Peace Rivers.

As a result of the completion of the electrical infrastructure, British Columbians expected the development of secondary industry to diversify their staples economy. Ray Williston, the Education Minister of the Social Credit government, predicted "...that a dramatic explosion in power development during the 1960s would draw the attention of the

2 Gordon M. Shrum, *Report on the Columbia and Peace Power Projects*, British Columbia Energy Board (Victoria: July 31, 1961), p. 28.

entire industrialized world to B.C."³ Premier W.A.C. Bennett, himself, was similarly convinced of the dual river policy's beneficial economic influence. He predicted: "If the two are developed together, it will catch the imagination of enterprisers everywhere. It would open an era of expansion unrivaled in North America's dynamic history" (Sherman 1966:245). In addition, the provincial government publication, *Facts and Statistics (1956)*, predicted the development of secondary industry as a consequence of hydro development by concluding that "B.C. has many rivers which offer opportunity for power development and consequent secondary industry."

Expectations of prosperity and substantial economic diversification had also captured the minds of many engineers and public officials at the close of the nineteenth century in Ontario. The professional engineer T.C. Keefer, in his address to the Royal Society of Canada on May 23, 1899, entitled "Canadian Water Power and Its Electrical Product in Relation to the Undeveloped Resources of the Dominion," illustrated the creation of value through electricity-aided manufacturing of resources and his vision of independence of Canadian industry in the following way:

'Heretofore we have cut our spruce into deals and exported it to Europe, and more recently into pulp wood and exported that to the United States; but manufactured by our water power into paper, the raw material would yield this country ten times the

3 Paddy Sherman, *Bennett* (Toronto: McClelland and Stewart, 1966), p. 226.

value it is now exported for.' In the future Canada's own "white coal" of falling water would deliver the dominion from its "hewer of wood" servitude to American industry and its bondage to American coal; it would speed smokeless, silent trains over vast distances; mine and electrolytically refine the complex ores of the Shield.... The application of modern electrical science to Canada's unique combination of natural resources practically guaranteed the coming, Keefer proclaimed, of a second industrial revolution.⁴

Keefer's vision typically described the dreams of many British Columbians during the 1960s and 1970s. In his view, the addition of a steady supply of cheap electricity from British Columbia's flooded valleys would provide them with an industrial energy advantage to develop diversified industries which produce value-added goods for export and consumer goods for domestic consumption. Furthermore, such hydroelectric developments were expected to bring regional independence from central Canada.

To oversee the orderly development of the hydroelectrical infrastructure in the province, the British Columbia Energy Board was created by the Social Credit government. Its first chairman, Dr. Gordon Shrum, was asked to pursue an independent

4 T.C. Keefer, "Canadian Water Power and Its Electrical Product in Relation to the Undeveloped Resources of the Dominion," May 23, 1899, Royal Society of Canada, *Proceedings and Transactions*, 2nd Series, Vol. V., 1899, pp. 3-40. This speech was reprinted in consecutive issues of the *Canadian Engineer*, August 1899, pp. 91-4, and September, pp. 124-7. For a brief survey of his ideas and career, see Nelles' introduction to T.C. Keefer, *The Philosophy of Railroads* (Toronto, 1972).

As quoted by H.V. Nelles, *The Politics of Development: Forests, Mines & Hydro-Electric Power in Ontario, 1849-1941* (Toronto: Macmillan Company of Canada Ltd., 1974), p. 216.

advisory role "on all matters of policy pertaining to power development, generation of transmission, and distribution, and other uses of water resources" (Swainson 1979:196-197). Shrum foresaw several things: the resource-access benefits, the economic benefits, and employment benefits as a result of hydroelectric development -- but he saw also the possibility of a temporary surplus which, in the interim, could neither be absorbed by the resource industry nor by the population of British Columbia. This foresight is evident in his *Report on the Columbia and Peace Power Projects* which described the costs, benefits, and power export potential of the dual river policy. His report was submitted to the Provincial Secretary on July 31, 1961 and included the following considerations:

The Peace River project is in a region of low economic development.... The reservoir area will act as an inland waterway which will open up the Trench area for timber removal, mineral exploration, and perhaps create a recreational opportunity in time. (Shrum 1961:28)

Under favorable circumstances, economic and employment conditions in British Columbia would be greatly improved by the development of both the Peace and Columbia projects more or less simultaneously, but since the minimum efficient development of either the Peace or Columbia will provide more power than British Columbia can absorb in the early years of the project, it is not economic to develop the two simultaneously without finding a very large market at remunerative prices outside the Province for this additional power. The only potential markets for British Columbia surplus power are in the United States Pacific Northwest, California, and possibly Alberta. (Shrum 1961:6)

Since 1961, not only the Peace River dams (the W.A.C. Bennett dam and the Peace Canyon dam), but also the Columbia River Treaty dams (Duncan, Keenleyside, and Mica) have been

built. Other electricity-generating projects were added: the Burrard Thermal Plant, the Seven Mile Dam, the Kootenay Diversion Project, and the Revelstoke Dam. Even before the addition of the Revelstoke dam in August 1985, it became evident that the British Columbia population and its resource economy could not absorb the mounting surplus of power. B.C.Hydro's name-plate capacity on March 31, 1985 was 10,503 Megawatts, its highest one-hour demand ever recorded to the end of 1985 (on Hydro's integrated system) was 6,816 Megawatts. This demand peak occurred on November 26, 1985 under extremely cold weather and represents a 35% over-capacity.⁵ In 1983 the "unplanned surplus" was anticipated by the president of B.C.Hydro, Norman Olson, as the entire capacity of Revelstoke dam (plus the surplus which already existed before this dam) came on line:

The surplus represents about 15 per cent of current load, Mr. Olson [the president of B.C.Hydro] said. More importantly, at current load levels, *the entire capacity of the [\$2 billion] Revelstoke hydro-electric project*, set to start coming on line next year, *will be surplus*. [About the companies that made firm inquiries to use the electricity, Mr. Olson asks:]
..."Where are they now?"⁶

By 1986 British Columbia had not attracted foreign capital as anticipated even with cheap electricity, nor has

5 Sources: *B.C.Hydro Annual Report 1984/85*, p.5; and the 1986 B.C.Hydro information pamphlet, *B.C.Hydro: The Background*, p. 3.

6 *Globe & Mail*, "B.C. Hydro Foresees Further Cuts in Capital Projects as Growth Slows," by Albert Sigurdson, September 26, 1983, p. B1, emphasis added and \$2 billion replaced for 1.6 billion.

the predicted electrical "power hunger" of the U.S. Northwest and California allowed British Columbia to transmit electricity at remunerative firm prices across the Bonneville Power Authority's transmission lines.⁷ B.C.Hydro is allowed to export only on a low priority basis at the end of the lineup with other U.S. Northwest utilities. The "unplanned surplus" is therefore putting pressure on B.C.Hydro to market discount-electricity to uncompetitive mines and retooled forest companies.

From the exposition of the problem so far, three developmental scenarios can be distinguished:

1. The "Dream Scenario" (Keefer 1899), whereby the pre-hydroelectric staples production is enhanced by a well engineered Canadian electrical infrastructure. In addition, the scientific application of electricity to staples production results in new manufacturing industries. Consequently, as Keefer predicted, this forward development would deliver the Dominion from its 'hewer of wood' servitude to American industry.

2. The "Extension Scenario" (Shrum 1961), whereby the pre-hydroelectric staples production enhanced by the dual river electrical infrastructure (the building of dams on the

7 The Bonneville Power Administration is an agency of the U.S. Department of Energy. Bonneville markets and generates electricity in the northwestern United States.

Columbia and Peace River) would open a new staples region via the reservoir and provide economic growth and employment benefits; the temporary surplus, however, would be exported to the U.S. and later recovered for use in British Columbia's industry. It is assumed in this scenario that staples production may continue.

3. The "Intensification Scenario" (1986), whereby continued staples production, closed mines, and an over-built electrical infrastructure exist along with plans to build more dams solely for export. Under these conditions electricity itself becomes an exportable energy product (a staple) and the need to sell it the export market increases. This export dependence coincides with the need to finance future power-exporting dams. They would be paid for through the long-term income of variable U.S. electricity revenues and the payment for variable size debt loads (induced by U.S. currency fluctuations). This thesis will examine these scenarios with particular attention to the roles of the provincial government and the Crown corporation, B.C.Hydro (see Appendix, Fig.1).

Argument: Brief Statement

I argue here that (1) the provincial state has allocated resources and intervened in such a way as to sustain a staples rather than a diversified economy, (2) B.C.Hydro, a Crown corporation, has been an instrument by which staples production has been intensified, (3) the state has been

constrained in its capacity to induce greater diversification by the already established resource industries.

Theoretical Analysis

Since the provincial state has the authority to develop hydro power and intervened in the production of electricity through B.C.Hydro, Offe's theory of state interventionism (extended to the staples economy) is applied to the aspects of the problem under study. These aspects are, the state's productive interventionist role in British Columbia's hydroelectric over-development, and the continued staples dependence. Interventions by the state occur by way of allocative and productive activity.

Therefore, the addition of B.C.Hydro to the provincial state, the building of dams, and the production of electricity are treated as a productive state activity. The provincial state is regarded as a resource-dependent peripheral state within capitalist society. The "unplanned surplus" of power is analyzed with respect to the limits of planning in a staples-dependent periphery. Theories of the peripheral state in Canada are in their developmental stages and European theories cannot be easily used to explain state policy formation and resource development in British Columbia. Consequently, the use of a blended theoretical approach which draws on staples theory (Innis, Watkins, Marchak) and Claus

Offe's interventionist "Theory of the Capitalist State and the Problem of Policy Formation" was explored.⁸

Methods

The research method employed is one of reviewing and collecting relevant historical evidence from books, reports, legislative acts, government policy statements and publications, B.C. Utilities Commission testimony, B.C.Hydro documents, and select informal interviews with relevant persons. The selection and examination is guided by the working hypothesis that B.C.Hydro is a major institutional force in extending and intensifying staples dependence.

A blended theory of the state and staples theory is used to examine the assumed relationships (implicit in the working hypothesis) between government policy, B.C.Hydro's contribution to the accumulation process, the development of hydroelectric power, and the diversification of staples production. A variety of historical data sources has to be examined to establish these relationships, because the

8 Harold Innis, *The Fur Trade in Canada* (Toronto: Toronto University Press [1930], 1956).

Mel H. Watkins, "A Staples Theory of Economic Growth." *Approaches to Canadian Economic History: A Selection of Essays* ed. M.H. Watkins & W.T. Easterbrook (Toronto: McClelland and Stewart, 1967) pp. 49-79.

Patricia Marchak, *Green Gold* (Vancouver: University of British Columbia, 1983).

Claus Offe, "The Theory of the Capitalist State and the Problem of Policy Formation," *Stress and Contradictions in Modern Capitalism: Public Policy and the Theory of the State*, ed. Lindberg, Alford, Crouch, and Offe (Lexington, Massachusetts; Toronto: Lexington Books, D.C. Heath and Company, 1975).

agencies of the provincial and federal state, such as departments and ministries, advisory bodies on policy, regulatory agencies, and Crown corporations are frequently undergoing internal reorganization to adjust to changing political and economic conditions. As they reorganize, the quality and relevance of information held in these agencies changes and information may also be moved to other agencies.

The historical evidence for provincial state intervention in the allocation of natural resources and production of electricity originates from government policies as evident in legislative acts, ministerial publications, scholarly publications, the B.C. Power Commission and B.C.Hydro. The research data to analyze the role which B.C.Hydro played in the extension of the staples economy originates primarily from B.C.Hydro's Industrial Development Department reports which are held in the B.C.Hydro library. The statistical information was obtained from three sources: B.C.Hydro's Department of Marketing and Planning, British Columbia government publications, and Statistics Canada. The verification of printed material and supplementary information is derived from informal interviews with selected department personnel. To unravel the industrial link to the "unplanned surplus," relevant planning submissions and testimony by B.C.Hydro and provincial government representatives to the B.C. Utilities Commission are examined. In addition, B.C.Hydro reports, and press reports are consulted. The research data which document the intensification of dependence (on staples production and

power production for export) are obtained from a variety of sources: the testimony of B.C.Hydro executives before the B.C. Utilities Commission (BCUC), the summary reports prepared by the BCUC, the reports by the the National Energy Board (a federal agency of Canada), and the press releases of the Bonneville Power Authority (released by the U.S. Energy Department). Because the "surplus shock" is a phenomenon of the 1980's and (much of the information is not yet officially documented) circumstantial accounts are taken from numerous U.S. and Canadian press accounts. Because the empirical units and terminology which describes British Columbia's hydroelectric development may be unfamiliar to the reader, a "Glossary" of terms has been added to the Appendix (Fig. 2).

The Boundaries of this Study

Five major assumptions underlie the approach to the problem: 1) the assumption that the majority of British Columbians thought B.C.Hydro policies would bring about a diversified economy, 2) that the motor of development in British Columbia is not consumer goods manufacturing,⁹ but an export and foreign investment-dependent staples economy which develops no substantial "backward" and "forward" linkages, 3) that the provincial state policies developed out of the instabilities of the staples economy which periodically needs

9 In the Canadian regional periphery, "...unlike European countries the motor of growth is not manufacturing but the export led sectors: furs, fish, timber, wheat, industrial minerals and energy products." Daniel Drache, "Rediscovering Canadian Political Economy" *Journal of Canadian Studies* (August 1976) 7.

state-entrepreneurial intervention to be re-balanced, 4) that British Columbia is not governed by an instrumental state which operates solely for the benefits of a particular particular interest although, the state, as Offe maintains, has built into its functions a selective process which favors the upper class, and 5) that hydroelectric development plans for British Columbia were not just the result of one man (W.A.C. Bennett), but rather the combined result of the actions by planners in the state apparatus, B.C.Hydro, and industry.

Excluded from this approach are: the domestic and commercial consumption of electricity (used in houses, office buildings, or retail stores), the environmental benefits (such as flood control), and the environmental destruction (loss of valleys, trap lines, fish and forests). Rather, B.C.Hydro's role is examined for its developmental influences on the staples economy and, therefore company planning, government policy adherence, and industrial development are emphasized. The Columbia River Treaty has been extensively examined by other scholars, and therefore is only a peripheral part of this thesis. The theoretical approach excludes a class analysis, since the analysis stresses the use of B.C.Hydro by the state in pursuit of building dams for industry, not in pursuit of direct class interests. The approach is limited to the examination of B.C.Hydro as a catalyst and intensifier of developments in the staples economy.

My own values are implicit in the approach to the analysis, they are: that secondary industry should have been developed by British Columbia's corporations since they received generous resource allocations and low-cost state-produced electrical power. Instead, both British Columbia's resource advantages and hydro power advantages over other regions appear to have been squandered. I therefore approach this study from a critical perspective.

Definitions and Concepts

The provincial state: This state is an authoritative entity which has the power to intervene. Its apparatus includes ministries, departments, regulatory agencies, advisory commissions, Crown corporations etc., and is given the political authority to administer the forests, minerals, and water power resources. When approaching the state's relationship to the staples economy, for purposes of analysis, the concept of the provincial state is employed in a more abstract way.

The provincial state apparatus: As described by Offe in a somewhat abstract way, is a historically accumulated network of legal and institutional formalisms covering and conditioning (almost) all of the processes and interactions that go on in a society. A capitalist staples state is the structure of those historical societies which reproduce

themselves through competition and exploitative staples commodity production.¹⁰

The accumulation process: Refers to the process of reorganizing, maintaining, and generalizing the exchange relationships. This process is frequently maintained by use of the "...large category of *public infrastructure investment* which is designed to help broad categories of commodity owners (again both labor and capital) to engage in exchange relationships."¹¹

"Unplanned surplus": This is the electricity surplus which resulted despite extensive planning by B.C.Hydro under the guidance of provincial government development policies. (Bill Best, vice president, Electrical Operations, asked whether Hydro is building for export, answered: "Our load forecasts, on which planning for our system is based, do not include any provision for supply for export. The construction and scheduling of additional generating facilities is based entirely on servicing forecast requirements in this province "...the National Energy Board of Canada ruled in support of

10 This is a restatement of Offe's concept of the capitalist state to fit the staples state. Claus Offe, "Laws of Motion of Reformist State Policies" Mimeo. Ollman, Bertell, and Edward Vernoff, *The Left Academy* (New York: McGraw Hill, 1982), p.4; also in "The German Debate," *The State and Political Thought* (Princeton: Princeton University Press, 1984) p.133.

11 Claus Offe and Volker Ronge, "Notes: Theses on the Theory of the State" *New German Critique*, 6 (Fall 1976) 143,144.

our contention that we have planned and constructed our system only for domestic needs."¹²)

Staple: A staple is a raw or semi-processed natural resource (e.g. export logs, pulp, metal ingots, energy products, lumber...) produced largely for export and comprising a leading sector of the economy.

Secondary industry: This term is used with reference to an industry which develops out of the staples economy because of diversification and product innovation. Watkins outlines its developmental sequence: "If the staple or staples generate strong linkage effects which are adequately exploited - then eventually the economy will grow and diversify to the point where appellation "staples economy" will no longer suffice.... A well developed secondary manufacturing sector serving domestic and possibly even foreign markets will emerge."¹³

Other Studies of Hydro

Few preceding investigations have studied the development problems of energy projects in British Columbia from a political economy perspective but several related works were produced in Ontario.

¹² Reprint from the May 16, 1980 issue of B.C.Hydro's employee newspaper, *Intercom*, printed by B.C.Hydro.

¹³ Mel H. Watkins, "A Staples Theory of Economic Growth," in *Approaches to Canadian Economic History*, ed. W.T. Easterbrook and Mel Watkins (Toronto: McClelland and Stewart, 1967) p.64.

H.V. Nelles in "Hydro as Myth," a related study, investigates the romanticism surrounding the harnessing of mighty rivers, the dreams of industrial evolution from steam-powered manufacturing, and the expectations of independence associated with hydroelectric developments in Ontario.¹⁴ The "Hydro as Myth" approach captures the "economically irrational" (e.g. the irrational over-investment) which gives shape (e.g. mega projects) to the uneven development. Gatt-Fly (a special interest group) examines energy issues with respect to provincially-owned power companies in the book, *Power to Chose: Canada's Energy Options*. Several developmental characteristics are identified in Gatt-Fly's book: the preference for large single unit power sources, the development of low-cost electric power for provincial needs, the U.S. export market as justification for surplus capacity, the "unplanned oversupply" which is not eliminated until 1995 (in Ontario), the environmental damage, the unending spiral of international debt, and the transition from merging provincial with international interests.¹⁵

In Western Canada, Larry Pratt documents in his essay "The State and Province Building: Alberta's Development Strategy," how the Alberta government through resource policies used provincial institutions as an instrument to

14 H.V. Nelles, *The Politics of Development: Forests, Mines & Hydro-Electric Power in Ontario, 1849-1941* (Toronto: Macmillan Company of Canada Ltd., 1974).

15 Gatt-Fly, *Power to Choose* (Toronto: Between The Lines, 1981).

increase its control over the accumulation process. The benefits were to accrue to local resource and government elites and the growing urban middle class. Before the resource advantage would be depleted, a transition to petrochemical, agricultural, and industrial diversification was to occur. In this approach the rate of accumulation from the resource royalties determines class formation and the degree of regional economic autonomy of the province.¹⁶ When applied to B.C.Hydro this approach would be limited to the following: the collection of resource rents from valleys (e.g. the Columbia River Valley), river regulation benefits, provincial state water taxes, the class formation around the building of energy-producing dams, and the tax and royalty-relationship to building the province. Pratt focuses on growing regional independence, whereas British Columbia's hydro-development in the 1980's is characterized by increasing dependence.

In British Columbia, two academic books were written about the Columbia River development. Neil Swainson's comprehensive historical case study, *Conflict over the Columbia: the Canadian Background to an Historic Treaty*, describes the complex process of negotiations between the provincial, federal and U.S. government. Similarly set in the Columbia region is the case study for students in fields such

16 Larry Pratt, "The State and Province-Building: Alberta's Development Strategy," in *The Canadian State: Political Economy and Political Power*, ed. Leo Panitch (Toronto: University of Toronto Press, 1977), p. 133-162.

as engineering, planning, geography and public administration by J.W. Wilson, *People in the Way: The Human Aspects of the Columbia River Project*. Wilson examines the personal, compensation, and resettlement issues of the people of the Arrow Lakes who were affected by Hydro's development of the treaty dams.

Several relevant academic studies have analyzed the development of B.C.Hydro, such as the thesis, "Development of the Electricity Industry in British Columbia," (1965) by Mary Taylor. She documents the geographic expansion of the electricity industry from 1883 to 1961. In addition, William Tieleman, in his thesis "Political Economy of Nationalization: Social Credit and the Takeover of British Columbia Electric Company" approaches the takeover as an "example of a provincial state's relative autonomy being exercised in a dynamic situation." He analyses the historical developments with reference to class, the judiciary and the state leadership. Marvin Shaffer, on the other hand, in the paper, "The Benefits and Costs of B.C. Hydro Construction Projects," provides a cost benefit analysis of Site C and the Cheekeye-Dunsmuir projects.¹⁷

The primary concern of this thesis is with B.C.Hydro's relationship to the resource economy and the use of

17 Marvin Shaffer, *The Benefits and Costs of B.C.Hydro Construction Projects*, a publication from the British Columbia Economic Policy Institute, Paper No. P-86-01 (Vancouver: University of British Columbia, January 1986).

electricity in British Columbia's manufacturing industry. Beside the residential use (9,793 GW.h), and commercial use (8,313 GW.h) of electricity, the industrial use (13,568 GW.h) represents the largest category of consumption (see Table II). Previous studies have not sufficiently separated for whom the electricity is actually produced. Therefore, in this thesis the focus is narrowed to the production of electricity for British staples industry and the anticipated secondary industry.

Chapter Content Summary

Chapter two contains a discussion and framework of staples theory (Innis, Watkins, Marchak) and Offe's "Theory of the Capitalist State and Policy Formation." The theories provide a framework to understand the functions of state intervention in order to maintain the accumulation process in a staples-dependent region. Chapter three provides the documentation of state intervention in the allocation of natural resources, the formation of policy, and two interventions in the production of electricity (by the B.C. Power Commission 1945 and B.C.Hydro 1962). In Chapter four, the relationship between B.C.Hydro and the staples economy will be documented and analyzed. The primary focus will be on B.C.Hydro's promotion of staples production, the use of B.C.Hydro's infrastructure by staples producers, and the lack of influence of electricity on product innovation. In chapter five, the contradictions between state planning (the

government's and B.C.Hydro's) and the planning disallowed by staples producers (and the staples economy) are analyzed. The dynamic influences of the "power trap," such as the restructuring of B.C.Hydro, the rising rate of unemployment, and the formation of "backward" and "forward" policies (i.e. discount and export policies) will be examined in chapter six. The Appendix contains a glossary of electrical terms and primarily historical industrial statistics of power purchases.

CHAPTER II

THEORY

The Central Question

Why did the provincial state's intervention in developing public hydro power, intended to diversify the industrial base, actually intensify British Columbia's staples dependence? To approach this question, we need to develop some insight into the nature of the state in capitalist society, and more specifically into the nature of the state in a resource-dependent (staples) economy.

This chapter provides a discussion of the theoretical framework used throughout the thesis. The first part is concerned with the staples theory, the second with the theory of the state as proposed by Claus Offe.¹

Staples Theory

A staple is a raw or semi-processed material extracted primarily for export and constitutes the leading edge of a regional economy. A staples economy therefore is by definition not a diversified manufacturing economy.

Staples theory as developed by Harold Innis is concerned with the general impact on the economy and society of staples

¹ Claus Offe, "The Theory of the Capitalist State and the Problem of Policy Formation," in *Stress and Contradictions in Modern Capitalism*, ed. Leon N. Lindberg, Robert Alford, Colin Crouch, and Claus Offe (Lexington: Lexington Books, 1975), pp. 125-44.

production.² Mel Watkins restated staples theory to explain its distinct kind of economic growth characterized by an overconcentration on resources in the export sector and possible development of the "staples trap."³ Pat Marchak identified the persistent instability caused by the staples production process which is controlled by corporate directives from outside the resource periphery.⁴ The major emphasis on the use of staples theory in this thesis will be on the relationship between the provincial state and the infrastructure development for staples production.

In staples theory, as Watkins restated it, the state is almost a by-product of the requirements of staples production (Watkins 1977:89). Harold Innis identified the colonial roots of the state's subordinate relationship:

Energy in the Colony was drawn into the production of the staple commodity both directly and indirectly in the production facilities promoting production. Agriculture, industry, transportation, trade, finance, and government activities tend to become subordinate to the production of the staple for a more highly specialized manufacturing community. (Innis [1930] 1954:385)

He points out two levels of involvement by the government, the direct promotion of staples production and the indirect

2 Harold Innis, *The Fur Trade in Canada* [1930] (Toronto: University of Toronto Press, 1954)

3 M.H. Watkins, W.T. Easterbrook, "A Staples Theory of Economic Growth," *Approaches to Canadian Economic History: A Selection of Essays* (Toronto: McClelland and Stewart, 1967), pp. 49-73.

4 Pat Marchak, *Green Gold: The Forest Industry in British Columbia* (Vancouver: University of B.C., 1983)

government activities. The development of infrastructure, such as transportation, was subordinated to the production of the staple for a more specialized manufacturing community. In recent decades, the hydroelectric infrastructures have been expanded by the provincial states to serve such staples production. Hydroelectric facilities promote staples production by providing water transport access to remove timber or minerals and by providing a source of energy (electricity) for staples production. Watkins argues that policies to develop infrastructure can ease the development of staples production and foreign ownership.

The National Policy was a policy of industrialization-by-invitation and attracted foreign capital and thus foreign ownership under the aegis of the multinational corporation, rather than encouraging domestic capital.... Railways were built to facilitate staples production and only incidentally to create industrialization...⁵

In a similar way, the development of the hydroelectric infrastructure in British Columbia was promoted together with the development of forest resources by the provincial state. The quality of the accompanying industrial development was primarily confined to establishing saw mills, pulp mills, and their chemical suppliers. Various species of trees have been sequentially exploited during the expansion of forest processing.

⁵ Mel Watkins, "The Staples Theory Revisited" *Journal of Canadian Studies* 12 (Winter 1977), p. 88.

Structural Conditions

Two prominent conditions develop around the capitalist expansion of staples production: the overproduction or lack of demand for the staple, and the lack of secondary industry or product innovation.

Under conditions of overproduction of a staple (such as timber, coal, and other energy products) the regional population can wait out the "bust" until the manufacturing center indicates renewed demand, or it can try to convince the manufacturing center to obtain low-cost supplies from the overproducing region and not from another competing region. Watkins identifies one possible cause of overproduction, namely, that an excessive optimism leads to overexpansion and a 'boom and bust' psychology." But Marchak points out, it is in the interest of the manufacturing center to direct worldwide resource regions to overdevelop their resources in order to assure a low-cost supply relationship between foreign manufacturing interests and overproduction. Equally, it is in the interest of peripheries to develop their resources in a competitive global market. Yet in a region which experiences conditions of overproduction, the implications can be very serious.

Often political leaders accord much emphasis to the development of particular staples. At times this advances the

overdevelopment in one export product at the expense of developing the domestic economy. As argued by Watkins:

Staples exporters - specifically those exercising political control - will develop an inhibiting 'export mentality,' resulting in an overconcentration of resources in the export sector and a reluctance to promote domestic development (Watkins 1967:62).

Such a mentality has a substantial influence on planning for domestic economic development and does not generate flexibility. Instead, it overemphasizes the production of a dominant staple which reduces the possibility to shift easily with the needs of new markets. Watkins indicates the characteristics of such an event in an underdeveloped region:

The serious pitfall is that the economy may get caught in a "staples trap." Sustained growth requires the capacity to shift attention to new foreign or domestic markets. ... Both [markets] require institutions and values consistent with transformation, and *that* requires the good fortune of having avoided specialization in the wrong kind of staple ... if stagnation persists for any extended period because of a weak resource base, the staple economy can take on the character of the traditional underdeveloped country. Firstly, institutions and values can emerge which are inimical to sustained growth ... Persistent unemployment and underemployment will become characteristic of the economy. Immigration may be replaced by emigration ... In any event initial opportunities for easy growth will no longer exist (Watkins 1967:63).

Such a pitfall can be avoided by diversification, innovation, and strong linkage effects. Watkins has identified three such effects: backward linkage, forward linkage, and final demand linkage. Backward linkage is a measure to assess the development of resources and technologies which can increase

home-production. Forward linkages develop when industries evolve which add value by way of further processing. Final demand linkages are characterized by the development of the domestic production of consumer goods (Watkins 1967:55). The staples-dependent region, however, is less likely to develop consumer goods production and technological innovation than expand the development of infrastructure needed to help produce the staple.

Theory of the Capitalist State - State Interventionism (Offe)

Offe's theory does not address the problem of the staples-dependent state. But it can be applied to the development of infrastructure in such a state. It provides an enriched explanation of policy formation and the contradiction in planning for a staples-dependent economy. In addition, Offe's theory allows us to view the state's interventionist role in maintaining exchange relationships. It does this by allocating resources and developing public infrastructure designed to help broad categories of commodity owners.⁶

-State Interventionism

Offe argues the state in advanced capitalist societies has become increasingly *interventionist*. Since few peripheral regions produce their own consumer goods, having remained staples producing resource peripheries, the nature of the

⁶ Claus Offe and Volker Ronge, "Notes: Theses on the Theory of the State," *New German Critique*, Number 6, Fall 1976, pp. 137-147.

intervention by the provincial state is frequently by means of intensification of infrastructure development. The building of infrastructure, together with the allocation of resources, is required to continue staples production. As Offe claims, the scope of state intervention has increased, since states need to intervene more than in the previous century, in order to re-balance the accumulation process in advanced stages of capitalist development.

-Allocation and Production

The state intervenes primarily by using two modes of intervention. Offe categorizes them as the "allocative" and the "productive" mode of state intervention. Both modes are *interventionist* "... so far as they impose a certain order created by the state on an area of social and economic activity." Both are linked to a changing pattern of *threats*, perceived threats, or structural problems, that emerge out of the accumulation process and to which these modes of state activity can be seen as responses (Offe 1975:128).

-Allocative Mode of intervention

State intervention by means of the allocative mode imposes a certain authoritative order created by the state on an area of social and economic activity. When a staples economy uses input products such as natural resources which are already state property and do not need to be produced, then the state only needs to allocate them. As Offe

indicates, the *method* by which such state activity is designed is authority. This authority can be based on a constitution, on a system of legal norms, such as legislative Acts of various kinds, or on consideration of political majorities and political affiliations (Offe 1975:128). Offe outlines the following three distinctive conditions under which the allocative mode of state action takes place:

- 1) economic conditions under which a suitable environment for accumulation can be created and maintained merely by authoritative allocation of resources and "things" that are already "state property";
- 2) the elements of this environment do *not* have to be produced themselves, but merely *allocated*;
- 3) political power, or power in and over the state apparatus and its parts is the sole criterion and determinant of allocation, that is, there is no method of policy making other than politics needed (Offe 1975:129).

When applied to the staples economy, the allocative mode of state action is characterized by natural resource allocation. Such resources are provided by nature, and do not have to be produced by the state. The decisions, as to who should receive them, can be made by political direction of the bureaucracy or by legislation. If conditions of accumulation can be maintained without productive intervention, then all that is required of the state is intervention by means of allocation.

-Productive Mode of Intervention

Offe points out, if the accumulative process becomes too fragile, and the allocative mode of intervention is insufficient to deal with the threat to accumulation, then "the *productive* mode of activity of the capitalist state becomes preeminent." He identifies four elements which make up such a situation:

1. In order to keep the accumulation process alive (either on [sic] a firm, industry, regional, or national level), there is more and something *different* required than the allocation of resources and things that the state has already under its control. In addition to the state-organized *framework* of production/accumulation, some physical input into production is required in order to maintain accumulation (Offe 1975:129).

Such productive inputs by the state are required in the staples economy at times when it is not performing the accumulation process well. Under such circumstances, besides the maintenance of the economy organized around staples production and capitalist accumulation, some physical input is needed. At such times the production of the missing ingredient, either the production of infrastructure, or a missing commodity is required to maintain accumulation at different levels (in a firm, industry, a region or nation). Offe argues that usually such inputs are provided by the market.

2. Under normal circumstances, those inputs are provided by markets on which they appear as commodities: Labor, or variable capital, is to be found on the labor market, and raw materials and machinery, or constant capital is to be found on the market of investment goods, produced for

this market by capitalists who specialize in investment goods industries. In the particular situation that we are describing ...the quantitatively and qualitatively sufficient supply of capital fails to appear on the market.

3....[The third element is] the *failure* of some capitalists to *produce input commodities* on which the accumulation of other capitalists depend.... This failure can be due to either of three facts: Either the input commodities are so *costly* ... or there are *risks and uncertainties* involved in the buying of such input commodities (Offe 1975:130).

The costs, risks, and uncertainties of producing an infrastructure, or an input commodity which does not appear on the market are often absorbed by the state. In such cases the state needs to intervene and produce the missing input commodity to maintain the accumulation process. But why should a firm, industry, region, or nation become dependent on a state-produced infrastructure or input commodity? Particularly, if such productive inputs tend to be permanently too costly for them? Offe proposes the following answer:

4. ...accumulation can only take place if and to the extent that individual accumulating units find ways to protect themselves against the *constant competitive pressure* coming from other accumulating units If accumulation in an individual enterprise is going to continue at any given point in time, there must be certain *defensive mechanisms* available to the enterprise that allow it to protect itself (Offe 1975:130).

Offe discusses two kinds of defense mechanisms to deal with competitive pressures: 1) product innovation, 2) implementing of strategies at a "meta-level," namely at a level where "accumulating units gain a relatively superior position vis-a-vis other accumulating units" such as a firm,

an industry a region, or nation (Offe 1975:131). In peripheral states, product innovation is rarely used as a defensive mechanism against competitive pressure. On the contrary, the "meta-level" response is chosen, such as the development of 'infrastructure as industry,' or subsidized state-allocated and state-produced inputs, so the staples producer can compete with other regions and obtain maximum value. Offe argues the main reason for state intervention is to maintain the overall accumulation process in capitalist society. In defining the state, he stresses the functional relationship of the state to the accumulation process.

-The Concept of the Capitalist State

Offe's concept of the capitalist state is derived from the "...relationship between the state and the accumulation process" (Offe 1975:125). He underlines this point by saying that "...central to our definition [is]...the way it is functionally related to and dependent upon the accumulation process" (Offe 1975:125). In the staples-dependent peripheral state, the accumulation process is substantially based on exchange relationships (between capital and labour), and revenues from its staples production. Offe defines the state in terms of its relationship to such an accumulation process. The four functional elements of Offe's definition of the capitalist state are:

1. The state has no authority *to order production or to control it*. Production/accumulation takes place in [private] *enterprises* that are said to be *free* in the

sense of "*exempt from state control.*"

2. The state does not only have the authority, but the *mandate* to create and sustain *conditions* of accumulation.

3. The [capitalist state's] power relationships, its very decision-making power *depends* ... upon the presence and continuity of the accumulation process. In the absence of accumulation, everything, and especially the power of the state, tends to disintegrate.

We can call these three elements of the concept of the capitalist state the principles of "*exclusion, maintenance and dependency,*" respectively. *Exclusion* means ... that the state is not a capitalist itself, that is, something that has its existence outside the accumulation process. *Maintenance* implies that this process cannot perpetuate itself in the absence of this external being, that there are threats and possible disturbances to the process of accumulation that require some state-organized protection of the process. And *dependency* means that this protective device itself would be threatened if it engaged in policies inconsistent with its protective functions.

4. Legitimation, or the need for legitimacy, adds an important *fourth* element to the concept of the capitalist state.

...the state can only *function* as a capitalist state by appealing to symbols and and sources of support that *conceal* its nature as a capitalist state (Offe 1975:126,127).

When applying the first element (namely that production/accumulation takes place in private enterprises) to staples production, it is generally the case that staples producing companies (pulp producers, metal refiners, wood processors, chemical supply companies) are owned privately, although production/accumulation structures are increasingly overlapping with state structures (e.g. in Crown corporations). The staples-dependent state has limited control over staples producing companies. For instance, it has little control over when they produce, how they produce, and what

they produce. It has no power to make them innovate or produce consumer goods.

The second element, the mandate to "create and sustain *conditions of accumulation*" is particularly important at times when the state faces threats to the continuation of the accumulation process. Such threats in the state can be dealt with by the state at different levels of accumulation: at the level of individual accumulation units (e.g. companies, firms), at the level of industries (e.g. forestry or mining), or at the regional level (e.g. northern British Columbia). In this way, the state fulfills its mandate to create and sustain conditions of accumulation which are essential to maintain its power.

The state's power relationship depends upon a third element in Offe's theory -- the continuation of the accumulation process. The accumulation of royalties from natural resources, of taxes from wages, and of profits from the resource industries accumulate capital and power for the state. Political power in the peripheral state, therefore, is substantially dependent upon the accumulation process generated by the staples production. The state needs to protect and *maintain* the process of accumulation at the private sector and state level, since it is itself *dependent* on this process for its survival.

The state provides the condition for harmonious coexistence between these functional elements of accumulation through the fourth element, the legitimation by symbols and other sources of support to *conceal* its capitalist and staples-dependent nature. To do this, the state needs to project "...the image of an organization of power that pursues common and general interests of society as a whole..." (Offe 1975:127). State - generated infrastructure, for instance, can be portrayed as a miraculous economic and industrial diversification catalyst which is beneficial to all of society.

Policy Formation

Productive state activities require the formation of policies. In staples-dependent economies, the accumulation from staples production generates insufficient capital during times of acute competition with other regions. Offe argues, the reason the state needs to develop remedial policies is in response to "a twofold weakness of competitive accumulation itself":

...first, the economic weakness of being unable to produce the necessary inputs of accumulation through accumulation itself; and, second, the weakness that the ruling class, being made up of essentially *competitive* accumulating units, is unable to develop a class consciousness containing consented and workable directives as to how the state should operate. (Offe 1975:134)

He maintains that in an effort to overcome this twofold deficiency, the state develops the productive activity which supplements the material input that is needed for accumulation

(Offe 1975:134). To overcome those weaknesses, the state offers incentives and the required input to continue gaining revenues from the staples economy. Special policy concessions are made for the ruling class (e.g. staples producers, shareholders) in case of ruling class conflict. Obviously the state cannot always be in accord with the ruling class, since it is more important for the survival of the state to maintain the overall accumulation process than it is to achieve consent among the ruling class.

-Perception of the Problem (by the State)

Offe stresses the importance of not seeing the state only as a "problem solver", but also as a "perceiver of problems". Social and economic problems trigger changes in the formal strategies which the state adopts. To deal with them (e.g. forming staples bureaucracies or technocratic planning in Crown corporations), these formal strategies also determine how the state perceives the problems (e.g. lack of infrastructure, or expansion of staples development) and formulates policies.

For what the state does if it works on a problem is a *dual process*: It organizes certain activities and measures directed towards the *environment* and it adopts for *itself* a certain organizational procedure [e.g. allocative staples bureaucracy technocratic planning, or advisory bodies] from which the production and implementation of policy emerges. Social and economic problems, as items on the state agenda may trigger off changes in the formal strategies according to which the state operates, and conversely these strategies may substantially determine both the ability of the state to perceive problems and the nature of the ensuing policies (Offe 1975:135)

When a natural resource region develops an interventionist state subordinate to its staples production, its state employs a "dual process" when working on a problem: "It organizes certain activities and measures directed toward the *environment* [the natural, social, economic, and political] and it adopts for *itself* a certain organizational procedure (e.g. Crown corporate structure, advisory bodies, new departments, Commissions) from which the production and implementation of policy emerges" (Offe 1975:135).

Offe delineates three "logics" used in the formal decision making process which operate in public administration. These three "logics" of policy production are consensus, bureaucracy, and purposive action (Offe 1975:136). Offe argues that neither policy production by consensus, nor bureaucracy are sufficient to "decide upon productive state activity" (Offe 1975:136,140). Consensus becomes subversive to the administration structure, and bureaucracy is inefficient or incapable. Productive state activity requires purposive-rational action (such as in planning). Such state activity is controlled by a different impetus and different outcomes than bureaucratic activity:

A bureaucracy is controlled by *inputs* - be it will of a ruler or the law. This input is to be applied strictly, faithfully, and without exception, and the result is supposed to be "order." In contrast, what productive state activity presupposes is control by *output*: An activity is "adequate" not if it conforms

to certain established rules and procedure, but mainly if it leads to certain results (Offe 1975:136).

Before productive state activity can begin, questions about the outcome of the productive input (not raised in allocative state activities) have to be asked. For instance, Offe indicates, some of the following questions need to be considered before starting production.:

What is the final product, or purpose of state production? How much is needed in a particular situation? What is the most efficient way of producing it? Who should receive it? At what point in time and for what length of time? How should it be financed, and what priorities should be followed in case of cost increases and/or revenue decreases? (Offe 1975:136)

If the result is to be building an infrastructure or producing a commodity, the output determines the type of institution needed to carry out the completion of such a project. Since production usually occurs in private sector organizations, the organizational structure chosen by the state needs to resemble a private sector organization (as Crown corporations partly do). When seen from the purposive action perspective (characterized by planning), the output (e.g. the building of dams) is of primary importance in shaping the structure. Whether this output contributes to a more stable provincial economy, often, becomes secondary and is overridden by political goals.

Offe specifies three conditions for political goals to be implemented successfully in a purposive-rational manner: 1)

there must be "clear-cut goals," 2) "...there must be relative stability of conditions at least for the length of the production cycle," and 3) "...the purposive-rational type of action is applicable only where side-effects of the production process can be safely ignored (or compensated for) by the organization" (Offe 1975:138,139).

For the state to set "clear-cut goals" for a staples producing region implies that courses of action in the region are predictable. However, growth in staples production is substantially dependent on the economic, social, and political environment of manufacturing centers (e.g. in North America, Asia, and Europe). This dependence, combined with the lack of incremental development of secondary industry are very unlikely to provide "relative stability" during the planning or production cycle of state inputs.

-Contradiction (Planning)

Because of the lack of diversification combined with persistence of staples dependence, in other words the lack of incremental growth or products innovation, "...extensive productive inputs organized by the state are an indispensable prerequisite for the accumulation process in advanced capitalist societies to take place..." (Offe, 1975, p. 142).

The technocratic approach does not work, because technocratic planning in a staples-dependent economy and maintaining this economy through "industrialization-by-

invitation," results in substantial decision control being held outside the province. Planning productive inputs for foreign controlled staples producers by means of "...an instrumental-rational mode of operation presupposes ... a degree of control over the relevant variables that is atypical of the capitalist [staples] state" (Offe 1975:143). "...The amount of state power required for comprehensive planning of the production process is denied to the state by the accumulating units themselves" (Offe 1975:143).

Offe closes with the question: "what entitles us to talk about the capitalist state as if it were part of social reality"?

He gives the following answer:

What is real about it [the state] is the constant attempt to reconcile and make compatible these various functions [related to accumulation] with its internal structure or mode of operation. But what is equally real is the fact that there is neither visible nor to be anticipated a strategy that actually *does* reconcile these functions and thus achieve a balanced integration of the state and the accumulation process, that is, a reliable and workable strategy of "systems maintenance" (as many radicals believe) (Offe 1975:144).

-Application

The theory of the state in Canada is in its developmental stages, linkages between the state complex of institutions, government, its accumulation and legitimation functions are still being established.⁷ The use of a blended theory, as introduced above, can be seen as an exploration of insights

⁷ Leo Panitch, "The role and nature of the Canadian state," *The Canadian State* (Toronto: University of Toronto Press, 1983) pp. 3-27.

into the functions of the peripheral state. The purpose in the application of the theory is to understand both continuity and change of function of the resource dependent state and to explore the contradictions in its mode of operation.

The mode of operation (allocative and productive) by which the state intervenes will be applied to the allocation of natural resources, and the intervention by means of state-production will be applied to the production of energy resources. B.C.Hydro is approached as the purposive-rational (planning, and building) agency which brings the energy resource into production for the development of primary and secondary industry.

The continuity of state functions with respect to the production of staples will be examined in contrast to innovation (the development of secondary industry and consumer goods manufacturing). In particular, the government's and B.C.Hydro's role in the production of energy for staples producers will be contrasted with the expectations of diversified industrial development.

Offe's concept of the capitalist state (derived from its relationship to the accumulation process) and the four principles (exclusion, maintenance, dependency, and legitimation) will be employed to analyze the institutional force of B.C.Hydro. If B.C.Hydro is to be a major

institutional force within the state and the instrument (means) of the state of productive intervention, then Hydro must fulfill the accumulation functions well.

B.C.Hydro and the government need to plan their productive interventions. However, such planning is subject to a major contradiction. The contradiction, as identified by Offe, is between the ability to plan and the planning denied by the accumulating units. The "unplanned surplus" will be examined with reference to the government's and B.C.Hydro's ability to plan and the planning denied by the staples producers.

The dynamic of change in Offe's theory originates from the perceived and real threats (competition, recession, lack of development) in the environment of the state. Seen from such a perspective, the surplus and "power trap" conditions lead to the change of internal mode of operation of B.C.Hydro (production planning to allocation planning) and the intensification of staples dependence. Hydro's institutional force which stems from maintaining the functions of accumulation through productive intervention, (production for export) will be re-analyzed in its larger foreign environment.

What an application of this theoretical approach reveals is the extension of the staples dependence, despite the internal changes and approaches the state takes to overcome

this dependence. The peripheral resource state appears to adopt an 'autonomous logic' (Eigengesetzlichkeit⁸) of repeated staples dependency within its structures.

⁸ Weber, *Economy and Society*, Volume 2, ed. Guenther Roth and Claus Wittich (Berkeley: University of California Press, 1978), p.1002.

CHAPTER III

STATE INTERVENTION IN THE ALLOCATION OF NATURAL RESOURCES AND IN THE PRODUCTION OF HYDROELECTRIC POWER

Introduction

In British Columbia staples producers need natural resources which are allocated by the state and energy resources which are either self-generated or state-produced. This chapter will describe and analyze the development of B.C.Hydro in the context of the structural conditions (for example, lack of economic development, or need for natural resource supply expansion) during the expansionary period in British Columbia's staples-dependent economy. It will be argued that state activity occurs primarily by two modes of intervention: the allocative and the productive mode of intervention. Both are employed to maintain the accumulation process in its staples-dependent order. The allocative mode of intervention is used to allocate the state's natural resources to staples producers and thereby a staples-dependent order is maintained. The productive mode of intervention occurs by way of producing the hydroelectric infrastructure (and generating electricity). Such productive interventions are preceded by policy formation.

Allocation of Resources

British Columbia has the right to allocate its own resources, having jurisdiction over the development of its minerals, forests, and flowing water. Two of the ministries

which allocate British Columbia's natural resources are the Ministry of Forests and the Ministry of Energy, Mines and Petroleum Resources.

The virgin forests of British Columbia did not need to be produced by the state. They are allocated to staples producers by way of legislative acts, government leases, special rights, and the management of the Ministry of Forests. The way they are allocated imposes a certain order on society and the economy, such as the staples production, the accumulation process, the energy requirements, and the ownership structure of the forest industry.

Currently 94 percent of the forest land in British Columbia is owned and administered by the provincial government. Retention of public ownership of forest land began with the Land Ordinance of 1865. This allowed the government to sell timber while retaining ownership of the land.¹

The salient considerations with respect to selling the timber for industrial use are contained in the Ministry of Forests Act of 1978 which gave the Ministry the clearly defined mandate to do the following: encourage maximum productivity of the forest resource; manage, protect, and conserve the forest; establish a vigorous, efficient and world-competitive timber processing industry; and assert the financial interest of the Crown in its Forest.² In line with

1 Ministry of Industry and Small Business Development, *British Columbia Facts and Statistics* (Victoria, 1984), p. 47.

2 Province of British Columbia, Ministry of Provincial Secretary and Government Services *Organization of the B.C. Public Service* (Victoria: Queen's Printer, 1982), p. 119.

this mandate the "private operators" can time the cutting and replanting of the trees subject to Ministry regulations and licenses.³

Over the years the number of private operators holding licenses and managing the forest have declined. Marchak found that the B.C. Forest Service supported arguments by large forest companies on the basis "...that larger timber holdings and longer-term harvesting rights would allow them to plan and therefore to implement sustained yield principles."⁴ Instead, some forest zones were heavily overcut, others undercut, and yields from forest lands were not sustained. The use of the allocative authority of the state was inadequate to prevent such practices.

Over the years a smaller number of forest processing companies, many from outside the province, have obtained the right to cut British Columbia's trees and have controlled the choice of the wood end product. By 1975, of the committed allowable cut 71.2 percent of the provincial total went to the 17 largest companies. They had gained substantial control over

3 For management purposes, the forest resource is divided into sustained yield units known as timber supply areas (TSAs) and tree farm licenses (TFLs). Timber harvesting in these units is delegated to private operators under a variety of licensing agreements. Forestry management responsibilities in TSAs are shared between the Ministry of Forests and private operators, while in TFLs they are the responsibility of private operators. Ministry of Finance, *Financial and Economic Review* (Victoria: Queen's Printer, August 1985), p. 73.

4 Patricia Marchak *Green Gold* (Vancouver: UBC Press, 1983), p. 37.

rights to forest land. These large companies had an overwhelming percentage of the manufacturing capacity: lumber 47.6 per cent, pulp 99.6, paper 94.0, and Plywood and Veneer 71.1.⁵ By the end of 1981, only two of the pulp and paper companies operating in British Columbia were owned by residents, one by the B.C. Resource Investment Corporation (assuming its shareholders resided in B.C.), and the other by the Prentice and Bentley families. Nearly all twenty-two (in 1980 B.C. had 24 pulp mills) were owned by "private operators" elsewhere. Marchak found the following ownership structure:

MacMillan Bloedel and Northwood are owned by Brascan-Noranda of Toronto. Weyerhaeuser, Scott, Weldwood, and West Fraser have American parents. Crown Zellerbach sold its B.C. holdings to a New Zealand firm in 1982. Tahsis is co-owned by Canadian Pacific Investments of Toronto and the East Asiatic Company of Denmark. B.C. Forest Products is co-owned by the Alberta Government's Energy corporation, Mead and Scott of the United States. Eurocan is co-owned by Enzo-Gutzeit of Finland and West Fraser of the United States. Quesnel River Pulp is co-owned by West Fraser and Daishowa-Marubeni of Japan. Cariboo Pulp and Paper is co-owned by Weldwood and Daishowa-Marubeni. Crestbrook Forest Industries is co-owned by Mitsubishi and Honshu of Japan. The major timber-holders are the pulp and paper companies.⁶

The colonial exploitation of forests, and industrialization by foreign staples producers has a long tradition within the staples-dependent state. In the 1980s the soliciting of foreign investment includes the availability of financial assistance for travel (\$2000 grants, and help while in B.C.) to those firms and associations whose

⁵ Marchak 1983, p. 84.

⁶ Marchak 1983, pp. 82,83.

"products or services contain significant British Columbia content." The Ministry of Industry and Small Business Development extends special assistance to those who want to sell their firms to a company which may want to vertically integrate its operation in British Columbia.⁷ The same Ministry issues an annual update on the publication, *British Columbia Facts and Statistics* (1956, 1964, 1983) which indicates that wood products are largely shipped to the United States, the United Kingdom, Europe and Japan (in 1956 71% U.S., 17% U.K.; in 1964 70% U.S., 12% U.K; and in 1983 57% U.S., 16.6% EEC, Japan 14%). The staples products are shipped for processing elsewhere. The fast consumption of timber by forest companies requires the workers, hired to process the timber, to adjust to the changes caused by the processing of a sequence of trees whose quality is declining. The provincial state not only allocates forest resources, but through its strategy of continuing "industrialization-by-invitation" helps to impose a foreign dependency order on the economy.

7 The Program is called "Incoming Buyers" and is described as follows:

1. Designed to assist firms in attracting potential buyers from outside the province. Often bringing potential purchasers to view a plant is a valuable sales tool for the firm concerned.
2. Financial support offered consists of return economy excursion air fare for the potential buyer, to a maximum of \$2,000.
3. The ministry retains the right to encourage and assist the prospective purchaser in visiting as many local companies as is deemed appropriate.

Ministry of Industry and Small Business Development, "Incoming Buyers," *Program Directory*, Vol. 10 (Victoria: Province of B.C., April 1981), p. 10.

The British Columbia government indicates that its "...stewardship role includes providing a healthy climate for growth in the mining sector while maintaining strict controls on when, where and how such development is conducted."⁸ Many politically directed decisions are made to direct the bureaucracy in the mineral allocation process. The routine allocative decisions about minerals are made in the Mineral Resources Division. This Division supervises the Titles Branch which records the location and work on mineral claims and leases (OBCPS 1982:82).⁹ Since the state depends on accumulation to maintain its varied functions, the Mineral Revenue Branch follows established legal norms to assess, collect, and audit mineral revenue as prescribed by the following statutes: the *Mineral Resource Tax Act*, the *Mineral Land Tax Act*, the *Coal Act*, and the *Petroleum and Natural Gas Act (Part XI)* (OBCPS 1982:84).

The Ministry of Mines is primarily preoccupied with the keeping of orderly registered claims, much as the Land Registry Office does for private property. The Ministry of Forests extends timber licenses and scales the stands. It is largely preoccupied with the smooth functioning of forest exploitation, not necessarily in the public interest. This is more likely to serve private interests. The contradiction is

8 The Province of British Columbia, *Organization of the B.C. Public Service* (Victoria: Queen's Printer for British Columbia, 1982), p. 81.

9 OBCPS stands for the manual *Organization of the B.C. Public Service*, see footnote above.

that private interests in turn are to develop the provincial forests and mineral economy according to public interests. Ministries have traditionally handed over the extraction of natural resources to private accumulating units in return for royalties and tax benefits. British Columbia's government obtains a substantial portion of its revenue directly or indirectly from this process. In the fiscal year 1984/85 natural resource revenues (\$726.5 million), mineral revenues (\$55.7 million), and forest revenues (131.4 million); in addition, taxed employment in private administrations of the resource extraction corporations form a substantial portion of the provincial budget.¹⁰

In summary, the British Columbia provincial state is owner and supplier of the natural resources and therefore required, by the nature of this dual role, to intervene in the staples economy in order to allocate the natural resources. In the forest industry, this allocation process has favored the concentration of ownership by state support of large, externally-owned corporations. Many of them are vertically integrated (e.g. pulp mill companies which own their paper-making industries) elsewhere and unlikely to develop secondary industry in British Columbia, but continue staples production. The power of the state has not been used to avoid the recurring problems of the staples-dependent economy.

10 The Province of British Columbia *Financial and Economic Review* Forty-fifth Edition, August 1985, p. 11.

Production of Electricity (First Intervention 1945)

-Rural Electrification Policy

Early in this century, many smaller communities obtained their electricity from municipal utilities and some remote settlements would use electricity which was generated by the nearby industry.¹¹ The number of agencies supplying electricity to communities and municipalities grew. "In 1909, 23 agencies supplied electric power. By 1930 this had increased to 41, and by 1944 to 65. Many of these agencies were small, serving only a few customers and as a result some rates were high..."¹²

The rates varied widely, and subsequent to a Commission being appointed in 1938, the rates were reappraised and reductions followed. Afterward, the government indicated its intention to improve rural service. Mary Taylor, in her geographic study of the electrical industry in British Columbia, indicates that no preferences for government ownership was stated in the Progress Report of the Rural Electrification Committee. However, these objectives were formulated in this report:

There are in Canada, the United States, and other countries examples of self-sustaining electric utilities, distinguished by progressive expansion of facilities, increased per customer use of electricity and reduced average cost to the public.

11 Mary D. Taylor, "Development of the Electricity Industry in British Columbia," M.A. Thesis (Vancouver: UBC Geography April 1965), p. 174.

12 Taylor 1965, p. 168.

...the success of a utility does not depend upon any inherent qualities of public or private control. The success of a utility depends upon the efficiency of the administration and the zeal of competent management,...

...All rural electrification is in some degree an expansion of the established central station industry [profitable efficiency] and is made possible only by the internal subsidy element operating within the utility enterprise, supplemented in some cases by government.¹³

From this report, three major policy objectives can be identified: 1) a combination of progressive expansion, increased per capita customer use, and reduced average cost of electricity; 2) a striving for efficiency of administration and zeal of competent management; and 3) a need for established utilities to operate the unprofitable rural electrification process. One way to increase the per customer use of electricity was to attract large industrial customers. Although not indicating a preference for public or private administration, the government decided on public control over the rural production of electricity. The efficiency of administration and competent management is not readily accomplished in an administrative bureaucracy but is understood to occur in firms managed as in the private sector, within the Crown corporate form.

13 The B.C. Rural Electrification Committee, *Progress Report* (Victoria: King's Printer, 1944), pp. 19,20, cited by Taylor 1965, pp. 170, 89.

-The B.C. Power Commission

The B.C. Power Commission, a provincial Crown corporate utility, came into existence on April 17, 1945 as a result of the "Electric Power Act."¹⁴ This was an Act to provide for improving the availability and supply of electrical power. It also empowered the government to expropriate any power site, or power plant needed in order to generate and supply power. This Act brought about the first major productive intervention by the provincial state in the generation and distribution of electricity. The main purpose of the act was to make electricity available at low prices in most regions of the province where such service was not profitable for the private sector.

The government of the day appropriated the properties of many small utilities -- they served as bases to expand service into rural areas. As a result, the Power Commission's capacity increased from 14,700 to 324,735 Kilowatts between March 1948 and March 31, 1958. At the same time its service range expanded and by 1956 it served most of the rural areas of the province. However, the lucrative urban markets of the more populated areas, namely the lower part of Vancouver Island, Greater Vancouver, the west and southwest Kootenay areas, and Prince Rupert were shared by the larger utilities. B.C. Electric, the largest, served the metropolitan areas of

14 B.C. Government, "Electric Power: An Act to Provide for Improving the Availability and Supply of Electrical Power" [Assented to 28th March, 1945.], *B.C. Statutes 1945*, Chapter 27, p. 45.

the southwestern mainland and Vancouver Island; the West and East Kootenay Power companies served the South Okanagan and the East Kootenays.¹⁵ While sharing the market with these utilities, the B.C. Power Commission continued to expand its acquisition and building of generating facilities, not only for residential, but also for increased industrial use.

For instance, with reference to the B.C. Power Commission's Whatshan dam development, on the Whatshan River, assumptions of an automatic link between cheap electricity and industrialization by means of forest resources were promoted. In the Power Commission's magazine *Progress*, the author of the 1951 article, "New Industry already promised Arrow Lakes," boosts this link by claiming that:

... a \$75,000,000 industry using Whatshan power and the forest resources of the Arrow Lakes, sharply pointed [sic] the contention that power, wherever it is developed and made available at reasonable cost, would be utilized by industry for the advantage of the country as a whole.¹⁶

Correspondingly, the Commission began setting low rates for pulp mills, mines, and other bulk users while absorbing the costs for plant installation and operation. The high demand by the pulp and paper industry on Vancouver Island gave

15 Neil Swainson, *Conflict over the Columbia* (Montreal: McGill-Queen's University Press, 1979), p. 33.

16 B.C. Power Commission, *Progress*, "New Industry Already Promised Arrow Lakes," July 1951, p. 10. Other references: "Power Means Progress"- domestic float (Aug. 1952); Elk Falls Co. Ltd news print mill, Alberni Plywood, (Aug. 1952:3).

rise to further hydroelectric developments.¹⁷ It was, nevertheless, soon noticed that while the costs to industrial customers dropped, the operating costs of the Power Commission climbed.¹⁸ In fact many mills gave up generating their own electricity because it was no longer profitable for them to produce their own electrical input. Furthermore, the Power Commission increasingly established the linkages between production of staples from timber and the ready availability of power to continue the process of such staples production.

By 1956 the Commission developed rural electrification and industrial loads on Vancouver Island and promoted expansion into the central interior of the province. C.W. Nash, the director of load development wrote in the opening remarks of the promotional study *Pulp and Paper Opportunities in Central British Columbia*: "The Central Interior of British Columbia contains the elements of timber, power, water, and transportation to support the profitable operation of the pulp and paper industry." The wastes of 450 small mills operating around Prince George and the 160 small mills near Quesnel would support a 300 ton unbleached kraft pulp mill. In order to assure prospective investors the additional timber source for pulp production, the promotional study indicated the general opinion "...that the Provincial Government is anxious to grant a license in this area to pulp and paper interests." The report went on to predict, as loads would outgrow thermal

17 B.C. Power Commission, *Annual Report*, 1956, p. 63.

18 *Progress*, August 1957, pp. 7,8.

plants and enormous water power resources, combined with a growing economy, would increase the demand for power, it would not be long before the first hydro project is constructed. The study then itemized the advantages of state-generated electricity for private companies:

The construction and maintenance of hydro projects by the Commission is to the advantage of private enterprise. When this is done, the private company will realize, through the Commission, the advantage of low interest rates, low depreciation rates, and non-liability for corporation income tax. Also the fact that the company's investment is held to a minimum is an added advantage.

...it is suggested that potential power is a tremendous asset that can be developed for industry into low cost electrical energy. This can be done and will be done. When? Depends on industry.¹⁹

Promoting the absorption of unprofitable generation of electricity by the provincial state in order to attract large industry to the northern and central British Columbia coincided with the downturn in the economy

Production of Electricity (Second Intervention 1962)

-Recession and Infrastructure

During the late 1950s the forest industry in British Columbia experienced a recession. As Table I indicates the unemployment rate reached 8.58 % in 1958 which was the highest since 1946. At the same time Robert Bonner, the Minister responsible for the Department of Industrial Development,

19 British Columbia Power Commission *Pulp and paper Opportunities in Central British Columbia*, June 1956, by C.W. Nash, and H.L. Briggs, pp. 1,14,15,16,17.

published that Mineral production in 1959 had, at the same time, sunk below the levels of ten years earlier.²⁰

Such periods of economic instability are times when the state organized framework of production and accumulation in the staples producing region becomes insufficient to maintain accumulation. Therefore, additional input (in B.C. it is often in form of infrastructure) into the staples economy is required.

TABLE I

Comparison of Average Annual Unemployment

Year	As % of Labour Force	Canada
	B. C. %	
----	----	-----
1957	5.04	4.61
1958	8.58	7.03
1959	6.47	5.95
1960	8.50	6.95
1961	8.52	7.15
1962	6.61	5.90
1963	6.39	5.53
	----	----
Average	7.16	6.16

Source: Statistical Analysis Department Commercial Services Division, B.C.Hydro, *Economic Goals for British Columbia a Parallel Study to the Economic Council of Canada's Economic Goals For Canada to 1970*, 6 July, 1965, p. 6.

When the state is confronted with such uncertainties in the accumulation process and plans to solve them through substantial productive intervention, new policies need to be

20 Hon. R.W. Bonner (Minister), T.L. Sturgess (Deputy Minister), *1959 Summary of Business Activity in British Columbia* (Victoria: Department of Industrial Development, Trade, Commerce; Jan. 1960), Statistical Supplement, p. XII.

developed. Shrum, the chairman of the British Columbia Energy Board (1961), together with the government of British Columbia, submitted such a policy.

-Dual River Policy

Gordon Shrum, in his *Report on the Columbia and Peace Power Projects* (1961), argued that the solution to stagnant development, particularly in the northern²¹ part of the province (the B.C. Power Commission had already developed the industrial capacity to serve the resource industry on Vancouver Island) was to build the Peace River dam. He pointed to the following benefits:

The Peace River project is in a region of low economic development. ... The reservoir area will act as an inland waterway which will open up the Trench area for timber removal, [and] mineral exploration ... it is felt by the Board that an early start on either project [the Columbia or Peace] will provide the Province with a much-needed economic stimulus and contribute to curbing unemployment.²²

The perception of the problem was one of needed intervention to build extra infrastructure, provide construction employment and added growth in the British Columbia resource economy. To respond by way of production

21 Marchak cites Premier W.A.C. Bennett's aims in "opening the North": "If there is anything that is of basic importance to the further development of British Columbia....it is the development of the rich resources of the northern and central regions" (Budget Speech, 17, 1954), *Green Gold*, p. 39.

22 Gordon M. Shrum, *Report on the Columbia and Peace Power Projects*, (Victoria: British Columbia Energy Board, July 31, 1961), p. 28.

intervention, the provincial state increased its involvement in extending the resource economy in both modes (allocative and productive). It needed to provide the substantially extra physical input in addition to the intervention in an allocative way. To provide the large scale planning and operating skills the provincial government integrated the B.C. Electric Company into the state apparatus. The provincial state has by this action taken on an extended role as producer of electricity and developer of a region.

-B.C.Hydro

The British Columbia legislature met on August 1, and gave unanimous approval to the Power Development Act, 1961.²³ The Act provided for the acquisition of the B.C. Electric Company by the Province of British Columbia, as well as the Peace Power Development Company.²⁴ Shrum became the chairman of the board of B.C. Electric. An issue of 100 million parity bonds at 5% were bought for \$38 and the newspapers responded favorably (Worley 1971:235). The *Sun* (August 5, 1961) wrote optimistically: "by taking over the whole electric works, lock stock and barrel, Premier Bennett's government has done more than reverse its earlier mistake in the Wenner-Gren franchise." (Worley 1971:235). The

23 B.C. Laws, statutes, etc. An act to provide for the reorganization of of the British Columbia Electric Company Limited and the development of power resources. *Statutes of B.C.* 1961, 2nd session, chapter 4. An act to amend the Power Development Act, 1961. *Statutes of B.C.* 1962, chapter 50.

24 Ronald Worley, *The Wonderful World of W.A.C. Bennett* (Toronto: McClelland and Stewart Ltd., 1971), p. 233.

government had reserved mineral and forestry rights for the Swedish developer Axel Wenner-Gren (in November 1956) defined as the "watershed of the Peace River and tributaries above Hudson Hope" plus the "Watershed of the Kitchika River," and a partial watershed of the Parsnip River. These rights were conditional on making timber surveys, railway surveys, and to "survey the water sources of the proposed area of development with the object of hydro development."²⁵ Wenner-Gren's Peace Power Development Company produced a report which identified the outlet for power as British Columbia and the Pacific Northwest, yet noted a possible export difficulty, namely, the transmission preference given to U.S. public agencies by Bonneville (U.S. federal utility).²⁶ At the time of the B.C. Electric takeover, the shares of the Peace Power Development Company were bought by the government of British Columbia.

Although British Columbians may support economic development, substantial opposition to the intervention (the take-over of B.C. Electric) by the government came from a fraction of the business community. At the time of the takeover, when controversy surrounded the fairness of payment for the B.C. Electric shares, Howard T. Mitchell, newly

25 "Text of Wenner Gren Memorandum of Intent" *Western Business and Industry* Vol. 31, March 1957, pp. 71,72.

26 Peace River Development Company *Power Capabilities and Operating Aspects of the Peace River Project and a Pacific International Power Pool* (Vancouver, May 1960) pp. i,25,27.

elected national vice-president of the Canadian Chamber of Commerce, told the Chamber [on September 21, 1961]:

'You see a still-dazed British Columbian publicly on view trying to collect his thoughts after discovering that his beloved free-enterprise province, without even a vote to favor such a course, has arrived at the position of being the most highly-socialized society in Canada, clearly well in the lead of socialistically backslid Saskatchewan in this respect.' He ticked off the things that disturbed him: the government was the biggest employer, ran its own railway, a giant power system, a transit system, bought and sold natural gas, controlled the operating policies of forestry and mining companies to a crucial degree, and could punish and reward by patronage on a scale previously unknown in Canada. 'And remember,' he said, 'all this has happened in a decade in the name of free enterprise.'"27

Mitchell did not see that the "free-enterprise" corporations themselves needed an allocation process to stave off the chaotic scramble for resources which would have occurred. Furthermore, he failed to mention the generous allocation of resources which were extended to the private sector, as well as the underwriting of a substantial portion of the generating cost for electricity which had been extended to industry. Mitchell's perspective on the takeover is in contrast to the government's. The government perceived the need for increased productive intervention as a response to the uncertain anticipated dangers of economic downturn in the staples economy and lack of expansion of this economy in

27 Paddy Sherman, *Bennett* (Toronto: McClelland and Stewart Limited, 1966), p. 255.

northern British Columbia and wanted to avoid future economic stagnation.

In the transition from private to government hydroelectric development, the nature of this development in British Columbia was changed from an investor-owned market-oriented approach to a particular government planning approach. During the expansion phase of hydroelectric infrastructural development and the expansion of pulp and mineral production, B.C.Hydro contributed substantially to the economic activity in the province.

B.C.Hydro's Institutional Force

B.C.Hydro a Crown corporation of a staples-dependent capitalist state was subject to certain exclusions, but became a major institutional force while intervening to maintain the overall accumulation process in British Columbia. I will argue that B.C.Hydro 1) was excluded from extracting profit from private industry and from directing industrial production, 2) has fulfilled the provincial state's mandate to create exchange relationships between labour and capital, 3) has maintained the power of the state which depends on the accumulation process, and 4) has legitimized the continuation of the staples-dependent state by appealing to desires of regional autonomy and showing images of monumental technological achievements which suggest impending industrialization.

B.C.Hydro in relation to the staples industry is a Crown corporation and not a profit-seeking private corporation. In other words, B.C. Hydro as an agency of the state is not expected to make profits from industry. It engaged in production but remains outside the creation of surplus value and profit. Rather, its production of electricity becomes a meta-level input to gain a competitive edge in the international staples commodities trade. As the Acres report indicates:

The low price of electricity relative to the internationally determined commodity prices of alternative sources of energy will be of particular significance in the future if the export oriented industries of B.C., particularly those which are capital intensive, are to remain competitive in world markets.²⁸

B.C.Hydro was planning part of its capacity for increased production in the staples industry. But other than producing electricity, it was not to produce electrical and mechanical equipment for its own use, or have a significant role in the development of machinery used in the staples production process. As a utility, B.C.Hydro is expected to stay outside the production process (besides producing electricity) and therefore has no control over the type of product manufactured with its electricity. The link between B.C.Hydro's electricity and the development of diversified production is not direct. What it can do is plan for consumption of

electricity in the already established staples production process, but it cannot make others develop secondary industry.

During its expanding phase B.C.Hydro became a government instrument to attract investment capital and employ labour. The giant investment projects (e.g. Revelstoke \$2 billion) attracted large amounts of capital and created employment. By 1977 the company employed 12,557 urban and migrating workers. In the cities this work force consisted of executives, planners, engineers, technical and administrative staff. In the interior of the province, a large work force of migrating construction workers moved from dam site to dam site. To secure these investments, the Crown corporation used the provincial credit rating (backed by government guarantees) and by 1985 it had accumulated debts totaling \$9,649 million.

Another of the government's uses of the Crown corporation for multiple objectives was the contribution it was to make to the general well-being of the provincial economy. During the "province-building" phase in British Columbia, B.C.Hydro became more than a mere Crown corporate utility. It became a state-organized entrepreneurial protection-mechanism in response to the recession and periodic structural problems in the staples economy (of depletion, overproduction and chronic absence of secondary industry).

As a state-owned corporation B.C.Hydro, much like a private corporation, accumulated assets and collected an increasing amount of taxes. It accumulated assets in the form of electricity-producing large dams, transmission lines, and other installations. Their value had risen to \$10.6 billion by 1985. The collection and retention of taxes in British Columbia became part of the regional power strategy of the provincial government. Premier W.A.C. Bennett warned the federal government in the B.C. legislature before the takeover:

"I want to serve notice to the federal government and everybody else that unless we get fair treatment we will have to take over the B.C. Electric. I can't believe that out of all the millions of profits of the B.C. Electric and other electric companies in B.C. \$ 350,000 is half the corporation tax. This government estimates its should receive \$1.4 million."²⁹

The former tax revenues of B.C. Electric were paid both to the provincial and federal government. By 1985, the British Columbia government alone (Hydro pays no federal income taxes) collected \$299 million (from B.C.Hydro's revenues of \$1,953 million).³⁰ But this is not the only tax revenue generated as a part of building and operating hydroelectric projects. The consulting company, Acres, in its report, *British Columbia Industrial Growth and Electricity Consumption*, itemizes further potential tax benefits, as a result of hydroelectric

29 Ronald Worley *The Wonderful World of W.A.C. Bennett* (Toronto: McClelland and Stewart Ltd., 1971), p. 231.

30 B.C.Hydro *Annual Report 1984/85*, pp. 2,3.

or thermal generating projects, which would accrue to government: "1. Federal direct and indirect taxes [B.C.Hydro does pay federal sales tax], 2. Provincial and Municipal taxes, 3. Social security payments, 4. Social security benefits, [and] 5. Subsidies [normally paid to the private sector]." ³¹ B.C.Hydro payments to the government now include, under the category "tax" in its annual reports, "water rates" which are payments for the use of river water in order to generate electricity. It can be argued that tax benefits collected during the building of hydroelectric projects and the collection of assets enhance the power of B.C.Hydro within the provincial state.

The Crown corporation, B.C.Hydro, and the B.C. Power Commission were at times subject to abuse by the governing political party. For instance, such institutions become political instruments in preparation for elections and their technological achievements are lauded to produce votes. The British Columbia Hydro and Power Authority was promoted as a provider of "cheap power" for the people by the Social Credit Party. Another example of political abuse was the Briggs affair which set a precedent in using Crown corporations to hide direct debt, ³² manipulate power rates (which otherwise

31 Acres Consulting Services Ltd. *British Columbia Industrial Growth and Electricity Consumption*, a report prepared for B.C.Hydro, September 1974, p. 2-13.

32 Hydro's \$9.5 billion dollar debt would be seen as direct government debt if it was run as a government department of hydroelectric development.

might reflect true costs), and extend natural resource access to semi-government corporations.³³

At the same time, a desire for regional autonomy became very strong during the 1960s and 1970s. The W.A.C. Bennett government aimed to build a strong province and decrease dependence on Central Canada. The building of dams and subsequent industrial development became part of the strategy to achieving this independence.³⁴ After the takeover of B.C. Electric, the British Columbia government, following the pattern of the staples tradition, expanded into areas more distant from the urban centers to use resources in valleys, canyons, and rivers for hydroelectric power. The dynamic impetus to undertake large hydroelectric projects came from the small business leaders and their aim to aggrandize "their" province.

33 "The general manager of the B.C. Power Commission, Mr. Lee Briggs, issued a three thousand word statement in which he declared that he would not stand idly by 'while those charged with the fiscal affairs of this province prostitute the 80,000 customers of the B.C. Power Commission to fulfill election promises.' The issues ... the government wished to refinance some its borrowing on behalf of the Power Commission in its effort to eliminate all direct debt-making them instead the obligations of the power utility, ... the requested rate increase ... be held up, ... the treasure in natural resources in the north in the north 'worth more than King Solomon's mines' allegedly being given to the Wenner-Gren interests." Neil A. Swainson, *Conflict over the Columbia* (Montreal: McGill-Queens University Press, 1979), p. 96.

34 Richards and Pratt argue that intervening in the economy for such an objective, a state administration takes power to utilize resources by employing "entrepreneurial development strategies." John Richards and Larry Pratt *Prairie Capitalism* (Toronto: McClelland and Stewart Ltd., 1979), pp. 327,8.

B.C.Hydro, in its role as a Crown corporate development company, can be used by the provincial state to conceal the region's nature as a an economically unstable staples producing periphery. Images of successful industrial developments, such as of monumental dams, circuit breaker galleries, penstocks, spillways, hydraulic gates, underground powerhouses, generators, turbines, and push-button consoles of powerhouse control rooms are impressive. The W.A.C. Bennett dam is two kilometres long and 183 metres high, 850 metres at the base and 9 metres thick at the top; the G.M. Shrum Generating Station (Powerhouse) built inside the bedrock of Portage Mountain is 272 metres long, 20 metres wide and 47 meters high; and Williston Lake covers an area of 164 600 hectares (mostly drowned forest).³⁵ At the time of building these dams during the 1960s and 1970s, superlative attributes of "largest single development," "biggest," "mightiest in the world" fitted with a cultural period where houses, boats, appliances, and cars grew bigger every year. The former chairman of Ontario Hydro Sir Adam Beck identified the thought behind gigantic hydroelectric projects: "Nothing is too big for us. Nothing is too expensive. Nothing is visionary."³⁶ Mega-dams give the appearance of an already existing industry which builds and produces mechanical equipment and electrical instrumentation. The idea of the existence of a secondary

35 B.C.Hydro, *W.A.C.Bennett Dam & G.M.Shrum Generating Station: Peace River Power*, a 4-page pamphlet available in 1986.

36 Paul McKay, *Electric Empire: The Inside Story of Ontario Hydro* (Toronto: Between The Lines, 1983), p. 15.

industry or at least the link to an impending formation of consumer goods manufacturing appears very logical. Such engineering accomplishments, gave support to the optimistic accounts of an impending British Columbia industrial evolution.

Conclusion

A major change has taken place in the way the provincial state intervened to maintain staples-dependent accumulation. Through its allocation of natural resources, it has substantially contributed to the creation of a staples-dependent order in the economy. In addition, the provincial state intervened by means of production of electricity which was generated and sold cheaply to the staples producers through the B.C. Power Commission. Thereafter, its larger successor, B.C.Hydro began to intervene in the economy of British Columbia in a much bigger way. It retained its institutional force while being perceived as a regional and an international defense mechanism for competitive pricing of staples products, and as a means of inducing the development of secondary industry.

That which has continued by way of productive and allocative intervention is the maintenance of British Columbia's staples dependence. What has changed by way of the two interventions is the following: within the state apparatus and in the provincial economy, B.C.Hydro has become an institutional force by coordinating the objectives of the

government through productive intervention in the staples economy.

Chapter IV

B.C.HYDRO'S LINK TO THE EXTENSION OF STAPLES DEPENDENCE

Introduction

In this chapter the perceptions and rationales evident in reports by B.C.Hydro economists, consultants, planners, and politicians about the use of the expanding infrastructure and industrial development will be examined. These views are contrasted and compared with the actual use of the reservoirs by forest companies and the use of electricity by British Columbia's manufacturing industry. In particular, its recent use by the Wood, Pulp & Paper, Chemical, and Primary Metals industry is examined.

Infrastructure

Some infrastructure was already in place in Northern British Columbia by the late 1950s, for example: the Alaska Highway; some developed oil and gas fields; the Westcoast Transmission pipeline extending from the Peace River area to the U.S. border (1957); and the B.C. Railway extension in 1958 (to Peace River, Chetwynd, Fort St. John, and Dawson Creek). To continue the addition of infrastructure and to improve the North's future, hydro-power pioneers in the government and in the private sector planned to develop the biggest earth-fill power-dam. One of those pioneers, Dr. Gordon Shrum set his "progressive ideas" in contrast to those of Alexander Mackenzie (who travelled upstream on the Peace River in 1793). Shrum reflected:

Mackenzie wrote in this journal about the foaming river but it is doubtful that he had any idea of the important role that power would one day play in the development of British Columbia.¹

Shrum foresaw the developmental role of power and saw the infrastructure itself promising collateral benefits. He pointed to the timber removal and possible mineral exploration made accessible via the reservoir (Shrum 1961:28), the reservoir itself would become a natural transport infrastructure to remove formerly inaccessible timber.

Twenty-five years after Shrum indicated the storage lake's transport potential, the manager of Finlay Forest Industries in Mackenzie (an instant forest company town of 6500 near the Williston Lake) stresses the importance of towing log booms across the lake: "If it was to go dry it would be quite a crisis around here." Finlay Forest Industries operates one saw mill and one energy-intensive groundwood pulp mill (the pulp is shipped to the Crofton mill in B.C., to Japan, India, and Mexico). The company is the largest bulk power customer of B.C.Hydro electricity in the Central Interior Division (actual consumption 239 GW.h in 1981/82, expected consumption 330 GW.h in 1982/83).² In 1964,

1 Shrum comments on the explorers journal in the "Foreword" of the book *The Big Dam Country*, by Bruce Ramsey and Dan Murray, A Pictorial Record of the Development of the Peace River Country, (North Vancouver: In Focus Publications Ltd., 1969). Dr. Gordon Shrum was the chairman of B.C.Hydro at the time.

2 B.C.Hydro, Table 1, "Bulk Power," Exhibit 97, B.C. Utilities Commission, Site C Hearings, 10 Feb. 1982, Sheet 2 of 4.

it obtained extensive timber licenses in the Trench (in the Peace River region) and now uses the reservoir's water surface provided by B.C.Hydro, rather than expensive logging roads, to transport the logs (in the summer by log boom or barge, in the winter by ice bridge) to its mills. The transportation distances from the timber supply to the mills are at present up to 75 and 100 miles across the water surface and within 3 years (by about 1989) will encompass the full length of the lake. In addition, logging roads are being built to the timber in higher elevations to truck the logs to the the lake. The reservoir has indeed become an important transportation infrastructure for both Finlay Forest Products and the company which owns 43.7% of the company's shares, British Columbia Forest Products.³

British Columbia Forest Products uses the reservoir in much the same way. It transports 1.7 million cubic meters of timber by water per year -- its entire 1986 cut. In the summer, the timber is transported by booming and towing; in the winter, by low level bridge (across the reservoir), ice bridge, or ice-breaking barge. From the forest resource it produces kraft pulp and dimensional lumber in its three saw mills (the lumber is sold to the U.S. railway market). This company uses the reservoir for transport. But instead of using the Peace River power as a primary source of energy, it self-

³ The information was obtained from Mr. B. Crooks (Manager of Finlay Forest Products in Mackenzie) and Mr. Karl Baker (logging manager of B.C. Forest Products in Mackenzie) on July 22, 1986.

generates 80 - 90% of its power from hog fuel (usually wood residue such as sawdust, shavings, bark, etc. generated from processing raw timber) and is striving towards energy self-sufficiency. The answer given, by a spokesmen in the corporate communications department of B.C. Forest Products, of whether building the dam and providing the reservoir made any difference to the forest industry was that it probably "speeded up the process" of tapping the forest resource in the Peace River area. Both companies agreed that the increased accessibility to the forest resource made a difference to the development of the town of Mackenzie. Its instant development was analyzed by Marchak, in *Green Gold*, in terms of class structure and population transience. Its inhabitants are employed in producing primarily forest staples, since both companies are still "looking at" the development of a secondary paper production industry.⁴ Pulp and dimensional lumber have continued to be the end products made from the lumber arriving at the shores of B.C.Hydro's artificial lake. They are processed by use of self-generated electricity (by use of hog fuel) and the electricity from the head of the lake -- the W.A.C. Bennett dam (built across the Peace River). B.C.Hydro has played a dual role, one, as a provider of infrastructure, two as provider of power for the forest processing industry.

4 Information from Mr. W. Hurt of the Corporate Communications Department of B.C. Forest Product's Vancouver Office, and the company's logging manager in Mackenzie, Mr. Karl Baker, and Murray in the Accounting Department July and August 14, 1986. Pat Marchak's analysis of Mackenzie is in "The Instant Town," *Green Gold*, pp. 303-322.

The idea of the important role that Peace River power assumed in the industrial development of the province was pervasive in many publications. B.C.Hydro's publication, *A Utility in an Expanding Economy*, describes its growing provincial power network: "This large power system is gradually being linked to more and more resource areas of the province, ensuring an adequate supply of power to support industrial development."⁵ Such expansion was based on the perception that "Hydro must keep pace with anticipated industrial development"⁶ and prepare to be a low-cost supplier of electricity to manufacturing. Since industrial development in British Columbia is largely directed towards the export of semi-processed materials, much of the manufacturing done in B.C. is primarily staples production.

Manufacturing

The term "Manufacturing" as it is generally referred to in provincial government publications does not mean British Columbians manufacture consumer goods, but rather, manufacturing describes the kind of "...production primarily destined for the wholesale market, for interplant transfer, or to order for industrial users, rather than direct sale to domestic consumers."⁷ On the other hand, Statistics Canada

5 B.C.Hydro Information Services *A Utility in an Expanding Economy*, March, 1970, p. 18.

6 B.C.Hydro (BCH *Energy Blueprint 1981:Introduction*)

7 Ministry of Industry and Small Business Development, "Introduction," *British Columbia Manufacturers' Directory*

uses a more comprehensive classification of twenty manufacturing industries which includes the manufacture of consumer goods. To assess the use of electricity in manufacturing, the four major industrial manufacturing categories out of the twenty categories (some of these 20 are in B.C.Hydro's Table II, abbreviation "Man.") are examined.⁸ The major purchasers of electricity in British Columbia's manufacturing industries are: the "Wood Industries," "Paper and Allied Industries" (pulp and paper), the "Chemical & Chemical Products Industries," and the "Primary Metal Industries" (for the 1985/86 purchases, see Table II). These are mostly staples industries or suppliers to staples industries.

In B.C.Hydro's Annual Reports, the rates charged for electricity to many such industries appear under the category

1985: A Directory of Manufacturing Activity in British Columbia (Victoria: Province of British Columbia, 1985).

8 The 1970 Revision of the Standard Industrial Classification includes: 1. Food and Beverage Industries, 2. Tobacco Products Industries, 3. Rubber and Plastic Products Industries, 4. Leather Industries, 5. Textile Industries, 6. Knitting Mills, 7. Clothing Industries, 8. Wood Industries, 9. Furniture and Fixture Industries, 10. Paper and Allied Industries, 11. Printing and Publishing Industries, 12. Primary Metal Industries, 13. Metal Fabricating Industries, 14. Machinery Industries, 15. Transportation Equipment Industries, 16. Electrical Products Industries, 17. Non-Metallic Mineral Products Industries, 18. Petroleum and Coal Products Industries, 19. Chemical and Chemical Products Industries, and 20. Miscellaneous Manufacturing Industries.

Statistics Canada *Consumption of Purchased Fuel and Electricity*, catalogue 57-208, 1982, pp. 62-68.

TABLE II

ACTUAL ELECTRICAL SALES FOR 1985/86 and GROWTH OVER 1984/85
BY STANDARD INDUSTRIAL CLASSIFICATION (SIC)
(Billed Basis, No Adjustments for Accruals)

	1985/86 (GWh)	1984/85 (GWh)	Growth %
Residential:	9,793	9,577	2.3
Commercial-Total	8,313	7,970	4.3
-Transp, Comm. & Ut	1,282	1,221	5.0
-Wholesale & Retail	1,918	1,805	6.3
-Finance, Ins, Real Es.	1,563	1,467	6.5
-Comm, Bus, Pers. Serv.	2,850	2,712	5.1
-Public Admin. & Def.	614	602	2.0
-Unclassified	86	163	-47.5
Industrial	13,568	13,221	2.6
(Excluding Marketing)			
-Metal Mines	1,930	2,170	-11.1
-Mineral Fuels	670	632	6.0
-Other Primary Ind.	229	189	21.2
-Food & Beverage Man.	364	345	5.5
-Wood Manuf.	1,871	1,751	6.9
-Paper & Allied Man.	5,791	5,477	5.7
-Primary Metal Man. (Smelting)	139	131	6.3
-Non-Metallic Min.	310	311	-0.3
-Petroleum & Coal	362	343	5.6
-Chemical & Chem. Man.	1,267	1,290	-1.8
-Other Manufact.	458	434	5.5
-Construction	176	148	18.9
Inter Utility	263	247	6.6
(New West & Can. Ut.)			
Firm Export			
(Point Roberts/Hyder)	14	14	1.4
Seattle City Light	134	0	
W.K.P. & L.	41	6	583.3
Domestic Marketing	1,011	446	126.7
-Metal Mines	230	34	576.5
-Paper & Allied	749	372	101.3
-Chem. & Chem. Prod.	31	40	-22.5
-Other	1	1	
Total Sales.....	33,138	31,481	5.3

Source: B.C.Hydro, Load Forecast Department, May 6, 1986.

of "Transmission," since staples producers in general receive their electricity right off the transmission line (the customer transforms it to the proper voltage). "Transmission" rate customers are primarily pulp and paper producers, wood manufacturers, chemical producers. Table VI (see Appendix) indicates the sales made to these industries by B.C.Hydro, from 1965 to 1976 (calendar years), and Tables VI, and VII (see Appendix) include the historic sales statistics from 1974 to 1985 (fiscal years). Added to the historic Tables VII, VIII, and IX (see Appendix) are probable projections of the number of B.C.Hydro accounts in these industries.

The low rate policy for purchasers of electricity at "Transmission" rates is usually defended as a necessity to promote industrial development, particularly in light of international competition among staples industries. An analysis done by the consulting firm Acres for B.C.Hydro is revealing. It states that ". . . the low price of electricity relative to the internationally determined commodity prices of alternative sources of energy will be of particular significance in the future, if the export oriented industries of B.C., particularly those which are capital intensive, are to remain competitive in world markets."⁹ This perception of necessity of a competitive international advantage has been

9 Acres Consulting Services Ltd., prepared for B.C.Hydro, *British Columbia Industrial Growth and Electricity Consumption*, (Vancouver: Acres, Sept. 1974), p. 2 - 9,10.

maintained by both the provincial government and B.C.Hydro as a powerful argument.

The electricity cost portion of total manufacturing costs (in 1970) for pulp production and the needed chemicals was high: for the "Chemical and Chemical Products" (8.51%), "Paper and Allied Products" (pulp and paper) (3.75%), "Primary Metals" (1.96%), and primary "Wood" manufacturing (1.16%).¹⁰ B.C.Hydro's sales of electricity to the pulp and paper industry doubled from 1,985 GW.h in 1965 to 4,209.9 GW.h in 1973 (see Table VI, Appendix). Buchanan described it by stating that "...the Authority's [B.C.Hydro's] stake in the fortunes of the industry is therefore enormous...."¹¹

-Wood Industries

Wood Industries (sawmills, plywood plants, and shingle mills etc.) are described in B.C.Hydro reports with reference to their timber sharing with the the pulp and paper industry. As already indicated in the previous chapter, the reduction in the number of sawmills, the coordination of timber use by larger sawmills and pulp mills, together with the expansion of the industry into the North, coincided with the growth in the purchase of electricity by wood industries. Thereafter, with the installation of more capital intensive machinery to

10 Acres, 1974, Table 2.3, p. 16.

11 B.C.Hydro, Statistical Analysis Department, *Pulp and Paper Prospects in B.C.* by T.D. Buchanan, B.C. Hydro Senior Economist, 21 December, 1964, Introduction page.

process the wood, the electricity consumption of this industry increased further.¹²

-Pulp and Paper

During the 1960s, B.C.Hydro's Industrial Development Department promoted the expansion of capital-intensive pulp and paper industries. In reference to its own industry survey, "The Pulp and Paper industry of British Columbia," by John Raybould, the B.C.Hydro magazine, *Progress*, measures the advance of a nation by its consumption of paper. Not Canada's consumption, but the U.S. consumption in 1965 is cited: 500 lbs per capita annually. While, the publication does not speak of the manufacture of fine-grade paper in British Columbia, its author is most impressed with increasing the production capacity of pulp mills and with the idea of "industrialization-by-invitation" (a continuation from the B.C. Power Commission practice). In admiration of the processing of B.C. forests by foreign companies the article lauds the following:

The list of major world companies now operating here, or with mills planned or being built, is impressive. Among these companies are the Reed Group of England, Svenska Cellulosa of Sweden, Unso Gutzeit of Finland, Feldmuehl of Germany, East Asiatic of Denmark, Weyerhaeuser and Mead of the U.S., and Mitsubishi and Honshu of Japan.

12 Acres, 1974, p. 2-8; and T.D. Buchanan, B.C.Hydro, Statistical Analysis Department, Commercial Services Division *Industrial Classification of KW.h Sold to Primary Potentials in the B.C.Hydro Service Area For Fiscal 1964/65*, p.3.

All the new pulp mills in B.C. will have an initial operating capacity ranging from 250,000 - 350,000 tons per year. Each mill represents a capital investment from \$50 million to \$100 million.
[original emphasis]

[The author of the article continues with an industrial invitation reminder:]
B.C.Hydro's Industrial Development Department, through such industry studies, helps to show and remind the business community both in Canada and abroad of the unique opportunities existing in B.C. for expanding or establishing distribution facilities and manufacturing plants to serve resource industries.¹³

Yet, the staples producers invited from outside the province were less interested in building the machinery for resource industries, than they were in a low cost natural resource supply. A study by B.C.Hydro's Industrial Development Department concluded that "Resource industries such as pulp and paper mills, processors of local minerals, etc. will locate in the area primarily because of the resource and not, primarily because of low cost power."¹⁴ The discounted electricity generated by the province provides an added bonus for those who invest in British Columbia. The effects of these policies were known by some B.C.Hydro economists such as the continued exploitation of the forest.

T.D. Buchanan, was aware of the the shift from one species of tree to another. He interpreted these changes with

13 John Raybould, "Paper for the World," a two-page reprint from the magazine *Progress* (Vancouver: B.C.Hydro, Fall issue, 1966).

14 B.C.Hydro, Industrial Development Department, *Power Intensive Industries for Peace River at - Site Power* (Vancouver: B.C.Hydro, August 1963).

reference to the Sloan report (1957): "The Coast zone will move away from an integrated forest economy producing saw logs, peeler logs and pulp logs towards one in which the production of pulp logs will predominate."¹⁵ From this he concluded that "the Coast zone itself is moving from "the age of fir" (sawmill economy) to "the age of hemlock" (pulp economy)." From 1946 to 1963 the pulp industry's consumption of Coast log production increased from 12% to 22%. Since then, the number of trees consumed by pulp mills increased throughout the province. In the interior, pulp mill companies "...purchased small sawmills to obtain their harvesting rights and reduce competition for the resources,..." thereafter followed the "...construction of lumber and pulp mills in combined operations in central locations;" at the same time the number of sawmills decreased from over 2000 in the 1950s to 330 in 1978.¹⁶

The pursuit of state policies which favor large corporations to direct the staples production from outside the province has implications for the diversification of forest products and secondary industry. The competition from the manufacture of B.C. finished products would not be, as Buchanan suggests in the interest of vertically integrated companies (in such a company the producer of the finished product, buyer of the pulp, and the pulp mill owner are the

15 T.D. Buchanan, Senior Economist, B.C.Hydro, *Pulp and Paper Prospects in B.C.* (Vancouver: B.C.Hydro, December 21, 1964) p. 7.

16 Marchak 1983, p. 40.

same) who manufacture their own finished products elsewhere. He concluded that diversification of forest products is affected by patterns of trade.

Foreign trade policies have hindered the development of a diversified forest products export industry in B.C. Recent announcements of new "captive pulp" capacities are a manifestation of these policies. The pulp customer has every reason to resist B.C. competition in overseas markets for his finished product. He is in a strong position to do so because he already controls, in part, his B.C. source of supply. (Buchanan 1964:2)

He was well aware that decisions about end products are made outside British Columbia. He argued that a lack of diversification inhibits the best use of the wood. There is insufficient value added and most important to an expanding electrical utility, the most beneficial future market for B.C.Hydro's electricity is not created. He found the following:

"...Most of the presently [December 1964] announced developments - whether linked with foreign capital or not - will result in products requiring maximum amounts of wood usage per ton of output, yielding minimum values, and requiring minimum amounts of electrical energy."
(Buchanan 1964:2)

To illustrate his point numerically he prepared Table III. As his tabulation shows, the diversified paper products, such as "Print paper," "Fibre board," and "Other paper boards," use substantially higher amounts of electricity and lower amounts of roundwood. Meanwhile, the Peace River area, surrounded by substantial forest lands, was developed to

generate a hydroelectric capacity of 3,425,000 KW (this is the combined capacity of the W.A.C. Bennett Dam and the Peace Canyon Dam). No application of this electrical power to higher grade paper products is apparent to this day in Mackenzie, the instant forest processing community near the Bennett dam reservoir. This power source could be absorbed to a greater degree within this region if it would be used to produce more sophisticated end products. Although the control over production is now largely out of the hands of the provincial state, it has the property rights over forest resources and water power and can make initial choices over

TABLE III
WOOD AND ELECTRICITY REQUIREMENT

Product Feet	Unit KWH	Wood-Pulp Content	Round-wood Elec. Equiv. Req.	Cu
Wood pulp	Short Ton			
Mechanical	" "	(air dry)	82*	N/
A**				
Chemical	" "	" " bleached	161	850
unbleached				520
Print paper	" "		98	1,470
Other paper	" "	unbleached	117	920
Fibreboards	" "		51	1,300
Other paper boards	" "		57	1,300

* U.B.C: "Forestry Handbook of British Columbia," 1957, p. 159.

** John G. Harvey (Sandwell and Company): "Stream and Power for Pulp and Paper Mills;" *Pulp and Paper Magazine of Canada*, July 1963, p. 348. (assumes wood requirement to be 1/3 chips and a 500 ton a day mill.)

Source: T.D. Buchanan (Senior Economist), B.C. Hydro, Statistical Analysis Department, Commercial Services Division *Pulp and Paper Prospects in B.C.*, p. 7.

their development. Contributions to initial choices of the development of water power can also be made by the chairmen of B.C.Hydro. Two recent chairmen had executive experience in the forest processing industry.

The former chairman, Robert Bonner, became a senior vice-president of MacMillan Bloedel in 1968, then the largest forest company in Canada. Effective January 1, 1976, he became chairman of B.C.Hydro. The current chairman of B.C.Hydro, Chester Johnson, formerly headed the Whonnok Industries Ltd. and West Fraser Timber Company Co. Ltd. Both chairmen therefore knew the important relationships between the forest processing industry and the production of electricity,¹⁷ but neither had been able to develop a substantial market for electricity in diversified paper products. Rather, pulp and the required chemical supply industry remain dominant in forest processing.

-Chemicals and Chemical Products

To produce kraft pulp, chemical ingredients such as sodium sulphate, caustic soda, chlorine, and other chemicals are needed. The producers of these chemicals are among the four major purchasers of B.C.Hydro's electricity. In a recent report prepared for B.C.Hydro's Corporate Economist Office, by DBA Consulting Limited, the relationship between the forecast

¹⁷ Canadian Press, "Bonner Profile," January 12, 1985. Rod Nut, "Changes at Hydro Spark Questions," *The Vancouver Sun*, March 29, 1986.

of purchases in the chemical industry was directly correlated with the pulp and paper industry. "Nearly all of the purchased electricity used in B.C.'s chemical industry is used to make products for use in the forestry industry and, in particular in the pulp and paper industry."¹⁸ One such chemical company has two plants in Southern British Columbia.

Hooker Chemicals, a subsidiary of Occidental Petroleum, has chemical plants in Nanaimo and in North Vancouver. By 1974, its North Vancouver production has quadrupled for chlorine and caustic soda. The Nanaimo plant supplies most of its production to the adjacent McMillan Bloedel pulp mill. "Over 90% of production of the two B.C. plants is sold as bleaching chemicals to major pulp mill companies in B.C..¹⁹ The electricity purchase history of the chemical industry can be seen on Table II above, and Table VI & VII (Appendix). Another industry which uses very large amounts of electricity is the primary metals industry.

-Primary Metals Industries
(mining, milling, smelting)

In the late fifties, the development of the Peace river was a puzzle to experts, since the Peace River Power Development Co. and the provincial government claimed:
"...much of the power will be used at site by industry

¹⁸ DPA Consulting Limited *A Forecast of Purchased Electricity Requirements of B.C.Hydro's Industrial Customers 1981-91*, a report prepared for B.C.Hydro (Vancouver, August, 1981) p. 24.
¹⁹ Canadian Occidental Petroleum, *Annual Report 1974*, p. 15.

'flocking' in."²⁰ To assess the possibilities of primary metal industries using power at site, B.C.Hydro's Industrial Development Department prepared a study of "Power Intensive Industries for Peace River at Site Power" (August 13, 1963). Its findings were that "it is very doubtful that any of the power intensive industries studied (e.g. aluminum, heavy water, silicon carbide, zirconium, titanium, hydrogen peroxide, ammonia etc.) can be induced to take "at site" Peace power in blocks of 10 MW or more, if a saving of only two mills is offered by the Authority over rates [of 4 mills] applicable at tidewater. "It is generally cheaper to move power from Portage Mountain (the site of the Gordon Shrum powerhouse next to the W.A.C. Bennett dam built across the Peace River) to Vancouver than to move materials twice that distance."²¹

In case of aluminum, Ivan Bloch and Associates of Portland, Oregon, prepared a detailed study for the B.C. Electric Co. Ltd. in 1961 in which it was concluded that in order to attract new aluminum producers to B.C. it would be necessary to offer 2 1/2 mill power at tidewater, and concessions such as tax holiday [sic] and subsidized sites. Power would have to given away free at Portage Mountain if a saving in power cost had to be used to offset extra transportation costs resulting from a site at Portage Mountain.

Estimated rail freight costs of one cent [applicable only to bulk commodities] per ton mile were used in this study; this figure was obtained from a discussion with Messrs. J. Broadbent and V. Paul of the P. G. E. Railway.

20 The Vancouver Sun, "Peace River is a Puzzle to Experts," *Electric Power in British Columbia*, a series of articles published in a special pamphlet form, (Vancouver, June 1959), p. 7.

21 *Power Intensive Industries*, 1963, "Conclusion"

In actual practice the transportation costs of moving material in and out of Portage Mountain would no doubt be higher because Mr. Broadbent said the railway has no plans of providing rail service to Portage Mountain, and this being the case, material would then have to move some of the distance by truck which in all likelihood would cost considerably more than one cent per ton mile.²²

The low cost of on site power and subsidized rail transportation would not be enough attraction to locate aluminum and other metal smelters in the Peace River area. Leaving aside the consideration of population, the location of the resource, transportation, and the availability of low cost power in the right combination are of greatest importance to the primary metal industry.

A suitable hydroelectric site was of great importance in the development of the staples production in the smelting refining and forest products industries. M.D. Taylor sums up the relationship between the growth in generating capacity and growth in production in the following way:

The early settlers of British Columbia were interested in the fur trade. Following these came those seeking mineral wealth; the railroad builders; the loggers; the fishermen and farmers; and finally the manufacturers [primarily staples producers]. There had always been manufacturing in British Columbia, but it was carried on on a small scale until the twenties. During the depression all industry suffered. It recovered during the war and since that time has gone forward at a greatly increased rate.

There is no doubt that the availability of electric power has played a part in this

22 *Power Intensive Industries*, 1963, p.1,3.

development. J.V. Rogers in his paper "Power, the Pathway to Progress" outlines the part played by electric power in the development of the large smelting and refining complex at Trail. The availability of large-scale, low-cost hydro-electric power motivated the establishment of the aluminum smelter at Kitimat. Also the availability of power has been important in the growth of the pulp and paper industry. In other industries too, the use of power is important but not as important as in the smelting, refining, and forest products industries. Because it is these latter industries which are important to the general economic development of British Columbia, it is evident that electric power has had an important part to play in the economic growth of the province.²³

Both the Aluminum Company of Canada (Alcan) in Kitimat and the Consolidated Mining and Smelting Company (Cominco) in Trail own their hydroelectric generating facilities. Alcan's Kemano project generated electricity since 1955, and Cominco bought out all but one plant of the West Kootenay and Light Company in 1947.²⁴ Both Cominco and Alcan have dominated the smelting industry in British Columbia.

The Alcan smelter has no demand for utility supplied electricity, because such vertically integrated companies supply their energy needs by means of what Acres calls "industry-owned generation" (see Appendix Table X, XI). In addition, "Alcan has the water rights to the Nechako and Nanika Rivers until 1999, and additional KWh would be available each year if these rivers are developed for hydro

23 Mary Doreen Taylor *Development of the Electricity Industry in British Columbia*, a M.A. Thesis, University of British Columbia, Department of Geography, April, 1965, pp. 176,177.
24 Taylor, 1965, p. 13.

power."²⁵ Besides having secured the right to further development of hydro power, Alcan has located its aluminum smelter near tide water in Kitimat. Besides its smelting operation, the company had (by 1954) integrated its power supply, the Kemano project, and the supply of bauxite in Jamaica. Its 1954 annual report indicates, the company ships its bauxite from Jamaica to Kitimat, processes the bauxite and alumina with the use of Kemano power into aluminum ingots, and ships these for manufacturing elsewhere.²⁶ In keeping with company tradition, Alcan picks the most suitable sites, and owns its hydroelectric projects (dams, powerhouses). Since electricity is such a large component of aluminum production, Alcan can ship its natural resource to the smelter and can ship out its staples such as aluminum ingots from Kitimat via tide water.

Cominco, in Trail, the other primary metal manufacturer, owns its hydroelectric facilities (Waneta, Corra Linn and others). Some facilities were directly owned by Cominco, others were held by its subsidiary, West Kootenay Power and Light. Cominco has recently sold all its hydroelectric assets to its utility and is currently trying to sell West Kootenay Power and Light. However, Cominco did not require B.C.Hydro's

25 The British Columbia Energy Commission, *British Columbia Energy Supply and Demand Forecast 1974-2006* (Victoria: Lieutenant-governor in Council, 29 November 1973), p.181. The Commission prepares annual reviews of supply, demand, and pricing of energy.

26 [Alcan] *Aluminum Ltd. Annual Report 1953/1954*

power to produce its various grades of lead, gold, silver, bismuth, Iridium and to process its phosphate and sulfate.²⁷

Despite the results of various feasibility assessments²⁸ which yielded no, or few potential consumers of large volumes of electricity in the mining and smelting industry, promoters in the B.C.Hydro's Industrial Development Department saw their role in encouraging new investment and enterprise.²⁹ This was done by way of providing "detailed information on the mining industry," and "offering confidential service without obligation to industrialists seeking information on plant sites in the Greater Vancouver area."³⁰ Part of the Industrial Development Department during the 1970s has been absorbed into the Properties Division. This Division developed industrial land along the B.C.Hydro railway and other strategic location in order to sell these properties to industrial users. The primary purpose of these land banking operations is for promoting the use of the B.C.Hydro railway system.³¹

27 The Financial Post Corporation *Cominco Ltd.* (Toronto: Maclean Hunter, Nov. 27, 1985), p. 4.

28 Another study was done by B.C.Hydro's Statistical Analysis Department *Electric Consumption in the B.C. Mining Industry*, June 1964.

29 T.D. Buchanan, B.C.Hydro Statistical Analysis Department, Commercial Services Division *British Columbia as an Investment Prospect*, 26 June 1967.

30 J.C. Dawson, Industrial Development Department, B.C.Hydro, *The Mining Industry of British Columbia and the Yukon* (Vancouver: B.C.Hydro, January 1968), introduction page.

31 John R. Bodnar, Industrial Development Officer indicated this is the extent of Hydro's present industrial development. Informal interview (May 6, 1986).

Diversification

Although B.C.Hydro built or planned to build many dams on the Columbia, Peace, Kootenay, and Pend Oreille Rivers, the perception of establishing a hydroelectric machinery industry was absent in its industrial development strategy. In the last twenty years, turbines, generators, electrical switch gear, and circuit breakers were bought in Japan, the Soviet Union, Europe and the United States (see Appendix, Fig. 3). Although B.C.Hydro allows a 10% preference provision for tenders (under \$100, 000) from British Columbia bids, and 5% if they are Canadian bids, a recent transmission tower steel contract was awarded to Korea. At times, custom steel fabricating work has been awarded to some local Lower Mainland companies, such as Canron Ltd. Western Bridge Division and Ebco Industries Ltd., small cranes (less than 25-50 tons) were built by manufacturers like Norelco Industries Ltd. in Surrey. Control panel housings are manufactured in the Lower Mainland by Westinghouse and Federal Pioneer, printed circuit boards and battery chargers are made locally. Yet, when all items manufactured in B.C. are added up, Stephen Tang, the Senior Electrical Equipment Inspection Engineer (of B.C.Hydro's Quality Control & Inspection Department) summarizes: less than five percent of all mechanical and electrical equipment used at dams in British Columbia originates from British Columbia. He confirms that no local spin-off industries in communities near dam sites have developed as a result of British Columbia's decades of building hydroelectric dams.

B.C.Hydro's Research and Development Department lends operational support in case a mechanical or electrical failure occurs, evaluates products used in B.C.Hydro installations, and provides suggestions for improving existing equipment. Although the department occasionally develops technology for which it obtains patents, the impact on the development of mechanical or electrical gear in the Province is small.

Extension of the Staples Economy

Development of secondary industry continues to be anticipated in many government publications. The annual report, *British Columbia Facts and Statistics* (1956), opens with the statement:

British Columbia, traversed by three distinct mountain ranges and with, on the whole, a high rate of precipitation, has many mountain rivers which offer opportunity for power development and consequent secondary industrial growth.³² (page twenty-five)

In the same publication, the "Manufacturing" Section's opening paragraph started for seven consecutive years (1956-1962) with the same claim:

"Secondary industries are rapidly accounting for a large portion of British Columbia's total production values."

32 T.L. Sturgess & R.W. Bonner, Department of Industrial Development, Trade, and Commerce, Bureau of Economics and Statistics, The Government of British Columbia, *British Columbia Facts and Statistics*, Volume X, 1956, pp. twenty-five, twenty-six. R.W. Bonner later became chairman of B.C.Hydro.

Thereafter, the leading production sectors of manufactured goods were introduced in order of gross product values. Some of the categories have been renamed and some give the impression of the apparent development of secondary industry.

Year:	1956	1983
1.	Sawmills	1. Wood
2.	Pulp and Paper	2. Paper and Allied
3.	Petroleum Products	3. Food and Beverage
4.	Fish-Processing	4. Petroleum & Coal Pr.
5.	Vaneers and Plywoods	5. Primary Metals
6.	Slaughtering and Meat-Packing	6. Metal Fabricating
7.	Sash, Door, and Planing Mills	7. Transportation Equipment
8.	Miscellaneous Foods Preparations	8. Chemical and Chemical Products
9.	Ship Building	9. Non-metallic Mineral Products
10.	Fertilizers	10. Other Industries

However, the discussion in the 1984 edition of *British Columbia Facts and Statistics* is less optimistic in its description of the rapid development of secondary industry. It states the following:

The provinces manufacturing industries are largely resource based: namely forest products, refined non-ferrous metals, fish products, and processed agricultural products....

The Wood and Paper and Allied Industries accounted for 45 percent of the value of provincial factory shipments in 1983. This domination is expected to continue in the near future although further processing of other resources and an expansion in higher technology products such as electrical equipment, industrial equipment, chemicals, and plastics is anticipated.³³

33 Don Phillips (minister), Ministry of Industry and Small Business Development *British Columbia Facts and Statistics*, 1983, p. 67.

The argument that a diversified manufacturing industry depends upon abundant supplies of electricity at a moderate cost does not mean that the abundance of low cost electricity brought about the diversification of the the manufacturing industry.

Out of the twenty manufacturing industries categorized by Statistics Canada, three -- "Wood Industries," "Paper and Allied Industries," and "Chemical and Chemical Products Industries" -- purchase on the average 85% of the total electricity used in manufacturing in British Columbia. A historical review of the purchase statistics of the three major industries for the period from 1962 to 1983 indicates that the variation of purchases, as a percentage of the total manufacturing, has stayed within the range of 81% to 87% throughout the growth of B.C.Hydro's production of electricity (see Appendix, Table XII). In summary, the addition of B.C.Hydro's electricity has not brought about diversified industry.

With the expansion of B.C.Hydro into the interior of the province, the provincial state's intervention in the production of electricity becomes evident. The "Wood," "Paper & Allied" (pulp and paper), and "Chemical" industries' show the state's increasing share of production of low cost electricity. Forest products industries purchased increasing

amounts of low cost electricity from B.C.Hydro and reduced their self-generation of electricity (see Table IV).

On the contrary, the smelting industries, represented by the category of "Primary Metals" (dominated by Alcan and Cominco), have purchased little electricity from B.C.Hydro, but increased their own generation. In contrast, smaller consumers in the "wood manufacturing" sector do not have

TABLE IV
THE INCREASE IN 'PURCHASED' VERSUS 'SELF-GENERATED'
ELECTRICITY
(Thousands of KW.h)

Manufacturing Industry		1965	1971*
-----		----	----
-Wood	Purchased:	595,972	1,091,457
	Self-generated:	393,297	249,878
-Paper & Allied	Purchased:	2,023,077	3,702,397
	Self-generated:	1,094,774	1,585,324
-Chemical & Chem. Products	Purchased:	460,829	1,106,056
	Self-generated:	1,130,562	1,002,238
-Primary Metals	Purchased:	131,636	233,735
	Self-generated:	5,493,595	6,491,173

Source: B.C.Hydro, Acres Consulting Services Ltd., *British Columbia Industrial Growth and Electricity Consumption*, (September, 1974), Table 2.2, p. 2-13, constructed from unpublished Statistics Canada data.

* B.C.Hydro's Department of Marketing and Planning has not compiled these comparisons for the 1980s.

the financial, water, or energy resources to generate their own power. They are more dependent on B.C.Hydro and pay higher rates than the major users.

B.C.Hydro's rate structure is a possible disincentive to the development of a more diversified manufacturing industry within the forest products sector. The "Transmission" rate is extended to 88% of the "Pulp and Paper" industry and to 80% of the "Chemicals" industry (see year 1983, Table VII, VIII, total British Columbia purchase: 1,270 GW.h, B.C.Hydro sales 1,018, approx. 80%). On the other hand, in the more diversified "Wood Manufacturing" sector (the production of lumber, plywood, doors, hardwood, floors, particle board, coffins, etc.) only nine accounts (or 256 GW.h), out of the total purchase of 1,979 GW.h in 1983, receive B.C.Hydro's Transmission rate (see Tables VII, XII). This means that approximately 87% of the purchases by customers in the "Wood Manufacturing" category are paying the higher General rate (in 1983, 4 cents/KW.h versus 2.5 cents/KW.h).

Although the total purchase of electricity in manufacturing increased from 3,808 (GW.h) to 9,780.4 (GW.h), the larger supply of electricity was applied to the processing of timber and chemicals used in pulp production. Since forest production consists largely of export staples, the increased availability of electricity did not diversify the staples economy.

Conclusion

B.C.Hydro consultants, engineers, and planners perceived the solution to the lack of primary and secondary industry in

British Columbia as one of of building the hydroelectric infrastructure and linking it to British Columbia's mineral and forest wealth. The Crown corporation's reports on industrial development show a preference for capital intensive, international, and large volume consumers of electricity. These perceptions contributed to building power capacity for the staples industry.

The Crown corporation developed access to northern resources and linked them with B.C.Hydro's power grid. The utility promoted and solicited consumption of low cost electricity in the staples industry (pulp and paper, wood products, chemical products, smelting). Contrary to the "Keefer scenario," the supply of electricity did not diversify manufacturing, but 85% of the purchased electricity for manufacturing was used in the production processes of the pulp and paper industry, its supplier the chemical products industry, and the wood industry. Most of "Wood Manufacturing," a more diversified form of processing timber, does not qualify for low-rate electricity purchases and does not benefit from the abundant supply of electricity in the same way as other forest processors. At the community level, the building of many hydroelectric structures did not lead to a diversified hydroelectric equipment industry, but to the promotion of tourism as a secondary industry around hydro dams. Just as in many segments of the staples economy, no forward and backward linkages were developed. B.C.Hydro

extended the staples economy by reproducing the ideas already stereotyped within the colonial traditions of the staples economy ("industrialization by invitation," "development dependent on the manufacturing centers").

In other words, B.C.Hydro did very little to change the perception and reality that staples exports are the leading sector of the economy. Its promotion of "industrialization by invitation" was extended to Canadian and foreign corporations. Its hydroelectric infrastructure was expanded to facilitate staples production. B.C.Hydro went beyond the role of a utility in the way it actively pursued government policy which extended the province's staples-dependent economy.

The government of British Columbia's "Energy Policy Statement Statement of February 1980," contains again the same industrial development assumptions of the 1960s and 1970s, despite evidence to the contrary that the resources are the primary attraction to industry in British Columbia, the statement repeats:

The province's hydroelectric potential is perhaps the strongest attraction for firms considering where to locate and expand³⁴

34 The British Columbia Utilities Commission, *Site C Report*, Vancouver, May 1983, p. 41.

Chapter V

PLANNING THE "UNPLANNED SURPLUS"

Introduction

The contradictions inherent in the expanded production of electricity by B.C.Hydro are examined in this chapter. First the major planning practices are introduced. Then, they are contrasted with the planning requirements of a technocratic approach to hydro development versus the economic conditions and quality of information available in a "boom and bust" staples economy. In the absence of a clear industrial policy by the government, the inherent contradictions are at the root of the "unplanned surplus." On the one hand, the state attempts to plan an economy using electricity as infrastructure for staples industries; on the other, foreign controlled staples producers thwart this process.

Within the provincial state, the government is "...entrusted with the management of our energy resources."¹ The 1962 Hydro and Power Authority Act allows B.C.Hydro substantial autonomy in planning the hydroelectric projects:

It gives Hydro broad power regarding the generation and supply of power in the province and the additional authority to carry out its work.²

1 From the "Energy Policy Statement (February 1980)," submitted as Exhibit 46 to the British Columbia Utilities Commission and cited in its *Site C Report*, May 1983, p. 41.

2 The 1962 Power Authority Act and the subsequent amended and currently R.S.B.C.179, c.188 give this power. *Site C Report*, p.42.

In addition, other government institutions such as the Ministry of Energy, the Water Rights Branch, Advisory Commissions, and the Cabinet contribute to the final decision to build dams. The broad powers given to B.C.Hydro are at the same time to accord with government policy directions. Two prominent policy directions are given to B.C.Hydro in the provincial government's Energy Statement on February 1980:

1) "We still have considerable untapped hydro-electric potential" [and B.C.Hydro should investigate this potential].

2) That "the province's hydro-electric potential is perhaps the strongest attraction for firms considering where to locate and expand." "...That a secure and reliable source of electricity is available to meet the Province's normal growth; and that electrical energy is available to all industries on a fair and equitable basis."³

The planning, designing, and building of dams require more than just a political approach to planning. Offe argues that the technocratic planning approach (purposive-rational approach used by experts) is confronted by many obstacles because of the choice of ends (such as building dams, where technical success may be easier to achieve than economic and social rationale). For the technocratic approach to be successful, there must be clear-cut goals, relative stability during the production cycle, and an ability to ignore the side-effects. When applying Offe's theory to the conditions in a staples-dependent economic environment, it becomes evident that during the 1980s the comprehensive planning

3 B.C. Utilities Commission, *Site C Report*, pp. 40,41.

approach encounters numerous obstacles. Responses by the major staples producers themselves deny the ability to plan comprehensively. The major problem for B.C.Hydro and the provincial government in planning the electrical load requirements for a staples producing industry, is the inability to obtain reliable information from staples producers.

Government and B.C.Hydro Solutions to Complex Planning Problems

B.C.Hydro and other provincial state institutions planned the public hydroelectric infrastructure for the expected industrial growth. The major assumptions were that the best solutions to complex planning problems can be found by: 1) accurate forecasting, 2) efficient development of the infrastructure, 3) building the projects at the right time and of the appropriate size, 4) determining the needs of purchasers, 5) credit financing of projects, and 6) the appropriate price of electricity.

Forecasting

In order to forecast the needs of industrial customers, district managers and the Special Contracts Department in B.C.Hydro asked planners in various multinational staples producing companies and local governmental agencies what they needed. B.C.Hydro described this process:

District managers consult local governments, business and industry representatives. The data is

compiled and analyzed. In addition expansion plans of existing large industrial customers are analyzed. Inquiries related to possible new industrial development are evaluated.⁴

The forecasts for industrial electricity requirements under conditions of a staples-dependent economy are difficult to predict. Consequently, the developmental logic of "industrialization-by-invitation" was followed, and extra allowances for industrial purchases of electricity were made for industries coming into the province. The British Columbia Energy Board (a Social Credit government advisory committee) in its forecast report, *Electric Power Requirements* (to 1990), refers to this practice of extra allowances:

In 1961 "...a large allowance was added to the base provincial forecast for new power intensive loads coming into the province. There was no attempt made in 1961 to allocate the new load to any particular area."

In 1970 "...substantial allowances were made for industrial loads in individual E.A.S.'s [Electric Service Areas, B.C. is divided into 18 such areas] over and above those already included in B.C.Hydro, Alcan, and Cominco projections."⁵

The practice of adding extra allowances for industrial loads continued in 1981. As a result of an "...unusually high number of inquiries from industrial customers, B.C.Hydro retained DPA Consulting Limited to construct a forecast of the

4 B.C.Hydro, "What you need," *Energy Blueprint 1981*.

5 British Columbia Energy Board (an Advisory Committee on the Power Market) *Electric Power Requirements: in British Columbia Projection to 1990*, Government of British Columbia, May 1, 1971, p. 11.

requirement of this group of customers through [to] 1991."⁶ Percent per annum forecasts were constructed by adding the combined purchased electricity requirements of smelting, mining, chemical and petro-chemical industries. Within these sectors, the smelting and petro-chemical sector forecasts were based on individual company projections.⁷ DPA's report predicted low (2.2% per year), probable (4.5% per year), and high (7.1% per year) increases in industrial consumption. In the same year this report was written, B.C.Hydro's *Energy Blueprint 1981*, urged increased hydroelectric development:

The growth rate of electric demand is forecast to increase by 6.1 per cent annually in the 11 years from April 1, 1980 to March 31, 1991. Hydro must keep pace with anticipated industrial development
...
It is vital to industry, to government and to the public that we plan today to meet customer requirements 10 or more years hence.⁸

B.C.Hydro forecasts differed from these of the B.C. Energy Commission's (the former name of the B.C. Utilities Commission). Before the Ministry of Energy, Mines and Petroleum Resources made a decision about granting an energy project certificate to build "Site C" (on the Peace River), it referred B.C.Hydro's application back to the British Columbia Utilities Commission for a review.

6 DPA Consulting Limited Vancouver, prepared for B.C.Hydro A *Forecast of Purchased Electricity Requirements of B.C.Hydro Industrial Customers 1981-90* (Vancouver: DPA, August, 1981), p. 1.

7 DPA consultants, 1981, p. 1.

8 B.C.Hydro, *Energy Blueprint 1981*, "Introduction."

The Commission heard considerable evidence regarding Hydro's forecasting record. In presenting the September 1981 forecasts, Hydro acknowledged that:

"Quite frankly, our forecasting record, like that of other energy forecasts, has deteriorated during the energy troubled seventies." (1:46)

A review of its past forecasts indicated that during the 1970's Hydro overestimated demand by an average of 11% in the fourth year and by 37% in the eighth year following the year of the forecast. Hydro's estimates for the largest component of demand, the bulk [industrial] sector, have been the poorest (Ex 12:C14).⁹

Size of the Hydroelectric Infrastructure

To solve the problem of finding the most efficient way of producing the hydroelectric infrastructure, B.C.Hydro assumed that the most efficient way of building the hydroelectric infrastructure was to build capacity before it was needed by its residential, commercial, and industrial customers. This was the dual river policy. The rationale with respect to industry was -- if electricity can be assumed to be "an automatic catalyst for jobs and industrial growth,"¹⁰ then the surplus can be exported until the anticipated industrial growth comes about. Shrum argued in the following way:

For the economic production of power there is a minimum limit to the size of the initial generating installations for both the Peace and Columbia projects. This minimum in each case provides more power than the Province can use in the early years of the projects.

⁹ BCUC, *Site C Report*, 1983, p. 58.

¹⁰ Paul McKay, *Electric Empire: the Inside Story of Ontario Hydro*. (Toronto: Between the Lines, 1983), p. 186.

If any market could be created for the unused portion of the generation it would, even if sold at a lower price, bring extra income to the project and so benefit British Columbia consumers. If this additional power could be exported at a recoverable basis, the receipts would reduce the costs of power to British Columbia consumers."¹¹

The benefits to the Province of such over-installation were seen to be the creation of extra revenue, and provision of an increase in reliability and flexibility in the system.¹²

Timing and Size of Projects

Rushed development was the characteristic response to the problem as to when the hydroelectric infrastructure should be built. Predictions of energy shortages were abundant. For instance, Phil Gagliardi, the Minister of Highways, predicted in the early 1960s:

By 1970 we will be walking around with candles on our hats to see your way if the Peace as well as the Columbia doesn't go ahead. I would like to know how we are going to sit around quibbling about it. We are not interested in the politics of power. We want to be able to turn on a switch and see the lights go on.¹³

Action and building during a booming economy were the priorities. Consideration as to when the projects were needed were supported with extrapolated curves of rising power consumption and incremental/per annum percentages.

¹¹ Shrum 1961, p. 27.

¹² British Columbia Utilities Commission, "In the Matter of British Columbia Hydro and Power Authority Applications for Rate Relief," *Decision*, February 28, 1983, p. 93.

¹³ Sherman, 1966, p. 225.

Purchasers' Requirements

B.C.Hydro claims that it planned and constructed its system so the state-produced end product (electricity) would be used for domestic needs. That means hydroelectric projects were built to generate electricity to be purchased by customers living in residential and commercial buildings and for British Columbia's industry. Yet, in the early 1960s, Paddy Sherman describes W.A.C. Bennett's reasoning for breaking the export barrier by means of the Columbia River Treaty. "If he could get the Peace going, Canada could still keep the whip hand in negotiations. Certainly the two rivers would produce a surplus of power. Therefore it must be sold in the U.S. Since Ottawa and Washington both wanted the treaty, it would become the implement to break the export barrier."¹⁴ A ready market for this power was widely assumed, and, since hydroelectric projects were good vehicles for capital investment and guaranteed by the provincial state's taxpayer, the financing for these projects was readily available.

The Financing of Projects

The financing of the hydroelectric dams drew on Canadian and American capital and followed established borrowing procedures. B.C.Hydro's *Energy Blueprint 1981* indicates that "funds are raised through borrowing and through rates paid by customers." "Most borrowing takes the form of long-term bonds

¹⁴ Paddy Sherman, *Bennett* (Toronto: McClelland Stewart, 1966), p. 246.

(20 to 30 years), through government trustee funds issued to the public, or through private placements arranged by brokers." The origin of funds varies. "Hydro usually looks first to Canada as a source of funds, but on occasion we [sic] must go elsewhere - usually to the United States, but also to Europe. Hydro's credit is a vital factor in attracting investments from these sources."

The Price of Electricity

Under the new B.C. Utilities Commission Act, the Commission regulates the rates charged by B.C. Hydro under the new provincial energy policy.¹⁵ Because prices for export of surplus power have been decreasing since 1980 (from 4.1 cents per KW.h in 1980 to 2.9 in 1985),¹⁶ the response by B.C. Hydro has been to negotiate and hope for firm export contracts.¹⁷

In order to increase its electricity rates, the utility is required to appear before the B.C. Utilities Commission. In its power to set rates, the Commission can request missing

15 Two Acts are of importance: "The B.C. Utilities Act" B.C. Statutes (1980), Chapter 60; "Hydro and Power Authority Act" B.C. Statutes (1979), Chapter 188.

16 *B.C. Hydro Annual Report 1984/85*, p. 11.

17 "Firm power is now being sold in the southern U.S. for less than four cents a kwh and surplus power from the Northwest is going into the Southern California market for less than two cents a kwh. To give you some appreciation of the relative meaning of those values, B.C. sold its downstream benefits to the U.S. under the 1964 Columbia River Treaty for 5.3 cents a kwh [the *Columbia River Treaty Protocol and Related Documents* states 5.3 mills per kwh, p. 178, in other words .53 cents a kwh], an amount that critics said at the time was a blatant give-away." Marjorie Nichols, *The Vancouver Sun*, April 3, 1986.

evidence, both from opponents and proponents of the rate increases. In addition, the Commission can cross-examine those who present evidence. With respect to rates, it has assumed a quasi-judicial role. After three very thorough hearings in the 1980s and fearful of anticipated consumer resistance (but also conservation, or the fear of increasing self-generation of electricity by industry), B.C.Hydro declared its "...objective of avoiding rate increases for a period of five years."¹⁸ During the Commission hearings, government agencies, other than B.C.Hydro, were requested to submit information.

The Ministry of Energy, Mines, and Petroleum Resources submitted the *Blue Paper No.3: Energy Considerations (October 1981)* to the Site C hearings. In this paper the assumptions were repeated that low electricity prices will attract smelter industries to the province:

The prices and availability of electricity in British Columbia has resulted in considerable interest among firms in this industry [the primary metals industry] in locating operations within the province.¹⁹

Several developments were given as examples: Alcan's expansion (by adding another smelter), Cominco's zinc smelter, two copper smelters, and two or three ferro-silicon smelters.

18 B.C. Utilities Commission, "In the Matter of Application by British Columbia Hydro and Power Authority," *Decision*, May 9, 1986, p. 42.

19 B.C. Ministry of Energy, Mines and Petroleum Resources, *Blue Paper No. 3 Energy Considerations*, October 1981, p. 21.

B.C.Hydro has sold on average less than 200 GW.h to the smelting industry since 1962. Alcan produces about 5000 Gw.h and Cominco about 3000 GW.h to supply their own operations. Both have taken advantage of the ideal hydro sites (which allowed them to produce cheap electricity) they already owned when B.C.Hydro came into existence. Neither B.C.Hydro's price, nor availability of power has been an incentive to any major smelting industry. In 1985 and 1986, B.C.Hydro sold 131 and 139 GW.h, respectively, to "Primary Metal" Manufacturers (see Table II, above).

The Solutions

From the above it can be concluded that five major solutions to the planning problems of the hydroelectric infrastructure emerged: 1) to make large allowances for new power-intensive industries during the 1960s, 1970s, and 1980s for industries coming into the province; 2) to build ahead of provincial industrial consumption requirements and plan for the export of the surplus electricity until the economy grows; 3) to finance the building of dams with U.S., Canadian, and European capital -- about half in U.S. funds; 4) to include the commitments of large industrial investors in planning the size of dams, transmission facilities, and electricity purchases; and 5) to solve the problem of large amounts of power (which come suddenly on line when big dams are finished and the industrial purchasers are not yet ready to buy) by temporary power exports into a "power hungry" United States

market. All these solutions to the development of hydroelectric power system harbor a substantial degree of uncertainty.

The Solutions and the "Unplanned Surplus"

Clear Goal Requirement

In order for the technocratic approach to be successful, Claus Offe argues, the state apparatus as directed by its government needs clear, conventional and operational cues as to what the goals of production should be. B.C.Hydro did not receive such clear policy directions. The B.C. Utilities Commission pointed out that Hydro was not given clear direction as to what its role in the industrial development by means of electricity-intensive industry in the province should be.

*THE COMMISSION HAS NO RECOMMENDATION ON GOVERNMENT POLICY IN THESE MATTERS. THE COMMISSION RECOMMENDS, HOWEVER, THAT GOVERNMENT POLICY WITH RESPECT TO BOTH THE TYPE OF INDUSTRIAL DEVELOPMENT IT IS SEEKING AND THE ROLE OF HYDRO IN FACILITATING ITS DEVELOPMENT SHOULD BE CLARIFIED TO ASSIST HYDRO IN DEVELOPING ITS PLANS, AND ALSO TO ASSIST FUTURE COMMISSION PANELS IN ASSESSING THE NEED FOR NEW SUPPLY.
(Original Emphasis)²⁰*

As indicated above, repeatedly, large industrial allowances were included in the forecast. Precisely in this category of industrial demand, B.C.Hydro's forecasting had been the poorest. "For example the 1973 bulk [industrial] sector forecast overestimated actual 1980 requirements by some

20 BCUC, *Site C Report*, May 1983, p. 301.

64.5 percent. The 1976 requirements forecast overestimated actual 1980 requirements in the bulk [industrial] sector by 25.8 percent."²¹ Such forecasts are used to make planning and engineering decisions, and therefore have serious implications for geologists, hydrologists, corporate planners, the construction work force, and other technical staff.

It takes 10 to 15 years to plan, design, license, and build a major hydroelectric project. Site information, planning analyses, engineering studies, drawings, contracts, and many other costly preparations are required years before construction begins. When a project is postponed, some of the work has to be redone. If projects are canceled, millions of dollars need to be written off. The *Site C Report* indicates expenditures on the "Peace Site C [project] are \$35,000,000" and "approximately \$160,000,000 has been spent on all major planned hydro, thermal and transmission developments, that are currently in the planning stage up to March 1982." Despite the industrial optimism expressed for growth in the British Columbia industry, official Statistics Canada publications of purchased electricity by major industries show little growth.

As Table V indicates, the total purchases of electricity reported to Statistics Canada by the staples producers in the

21 Columbia-Resources Group Ltd. in the report prepared for the B.C. Utilities Commission, *Assessment of B.C. Hydro Electric Load Forecasts Including Comparisons with B.C. Government Forecasts*, 5 November 1981, p. C-13. This report was submitted to the Hearings on Site C as Exhibit 12 (Nov. 24, 1981)

Mining, Logging and Manufacturing sectors of British Columbia have declined subsequent to 1976.

TABLE V
Consumption of Purchased Electricity by the Mining, Logging
and Manufacturing Industries in British Columbia
1975-1982

Note: All values are expressed in thousand MW.h

INDUSTRIES

YEAR	MINING	LOGGING	MANUFACTURING	TOTAL
1982	2 967.	41.6	8 963.6	11 972.2
1981	3 002.	40.5	9 076.1	12 118.6
1980	2 693.	38.8	10 042.2	12 774.0
1979	2 537.	37.1 ^r	10 008.4	12 582.5
1978	2 459.5	31.1	9 371.9	11 862.5
1977	2 373.1	32.0	8 915.5	11 320.6
1976	2 103.6	29.8	10 717.1	12 850.5*
1975	2 131.6	29.4	8 162.5	10 325.5

Source: Statistics Canada, *Consumption of Purchased Fuel and Electricity: by the Manufacturing, Mining, Logging, and Electric Power Industries* (Ottawa: Minister of Supply and Services Canada), catalogue 57-208, Volumes 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982.

Note: "Consumption of purchased energy by the industries noted does not represent their total consumption, in that the data exclude consumption of any self-produced fuel or electricity."

MW.h = MEGAWATT-HOURS: 1×10^3 kilowatt-hours.

^r = revised figure

* The highest total is caused by still unresolved accuracy in the Statistics Canada figures in the "Primary Metal Industries" line 12 category in Manufacturing (Cominco has likely reported self-generated power between 1962 to 1976) Statistics Canada in Ottawa can not reveal the reporting party. Cominco purchased power from its subsidiary West Kootenay Power and Light.

Stability Requirement

Since bringing a hydroelectric infrastructure (planning and building a dam) into production takes 10 to 15 years and the subsequent production cycle is 50 to 100 years, the implementation of a hydroelectric development program is particularly vulnerable to the structural conditions of a staples-dependent economy. They are: the depletion of the natural resource, the overproduction or lack of demand of the staple, and the lack of secondary industry or product innovation.

The limits to natural forest resources are singled out as the most important factor influencing future growth in the forest products industry. The Ministry of Energy in its "Industrial Sector Energy Requirement Forecast" (October 1981) found that logging and sawmill activity levels have been reduced to conform with limits of maximum harvests of 75 million cubic meters per year to 1995, or 75 million to 1985, and 85 million to 1990. Possible shortages of chips were identified along with a low increase of energy requirements in the forest industry of 1.15 percent annually until 1995.²² As the forest processing industry stops growing -- the electricity requirement for this industry (85% of Hydro's manufacturing industry consumption) declines. Such reductions

²² The Ministry of Energy, Mines and Petroleum Resources, *Blue Paper No. 3 Energy Considerations*, October 1981, p. 20. This paper was submitted to the Site C Hearings.

can also be caused by overproduction or lack of demand for the staple.

The "boom and bust" cycle, so much part of the staples economy, does not provide sufficient stability for the long term planning process which is required to plan major hydroelectric facilities. During periods of prolonged recessions, the original demand requested by the industry may no longer be needed, and during periods of sustained expansion, over-optimistic demand indications are given by the industry. B.C.Hydro's forecasting methods, used up until 1981, did not take into account such changes in economic conditions.²³ Furthermore, political leaders and British Columbia developers often assume that exports and the economy would follow a pattern of incremental growth.

On the contrary, British Columbia's dependent colonial pattern of economic development did not follow the capitalist growth pattern of the British Industrial Revolution, such as indicated by Karl Marx in *Capital*, where small master handicraft shops, producing consumer commodities, develop into manufactures and subsequently into large scale industries.²⁴ In British Columbia, industries developed from a mix of small staples producers and large staples producers to increasingly large staples producers (characterized by the a capitalist expansion of the staples economy). Continuous improvements

23 BCUC, *Site C Report*, p. 89.

24 Karl Marx *Capital*, chapters 13, 14, 15.

(productive technology) in the primary processing of the same end products (pulp, paper, lumber, minerals) continues to this day. This is not what T.D. Buchanan, a B.C.Hydro senior economist, expected. In his report, *British Columbia as an Investment Prospect*, he listed "...the reasons why a long term investor can realistically take an optimistic view of B.C.'s prospects for continued rapid growth:

B. C. has an expanding and vigorous population which assures a growing domestic market for secondary industries and the economic stimulus of expanding expenditures in social facilities, housing and public utilities."²⁵

Yet, the investors who would use substantial amounts of electricity were the staples producers. For example, pulp producers and their chemical suppliers did not establish secondary industry by way of diverse grade paper production. The investors in staples production have little confidence in producing diverse products for the domestic British Columbia market. Because they are overly dependent on foreign markets, the need for electricity remains substantially determined by staples products markets outside the province.

The Planning Power Denied in a Staples-Dependent Economy

With respect to Offe's theory, the following question arises: Is the power and knowledge for comprehensive planning

25 T.D. Buchanan, B.C.Hydro, Statistical Analysis Department Commercial Services Division, *British Columbia as an Investment Prospect*, 26 June 1967, Introduction: "Summary and Highlights," 7.(e).

of the electrical infrastructure for industry available to the peripheral state in which production is largely determined by forces outside the region?

When combined with other factors of production (capital equipment, labour, materials, fuel and managerial expertise, etc.), electricity, as one individual factor of production, contributes to the extraction of natural resources and the production of goods and services, and thus to the generation of value-added in British Columbia.

However, the demands for these goods (and implicitly, their value-added) are determined by exogenous market forces, particularly those of external export markets, in which the major portion of B.C. primary resources are sold.²⁶

The power to plan for electricity consumption in the resource sector faces a barrier to planning in three areas. 1) The foreign ownership, whereby directives and decisions are made in light of interests outside British Columbia; 2) the value and demand of staples products is determined outside the region, the resource itself is subject to depletion; and 3) the quality of information necessary for comprehensive planning is denied by staples producers. To plan a hydroelectric infrastructure for a staples-dependent economy, where most of the important decisions are made outside the region, is difficult.

In the pulp and paper industry the foreign ownership is substantial (Marchak 1983:87). Corporate head offices in

26 Acres, 1974, p. 2-8, 2-9.

eastern Canada, the U.S.A., Europe and Japan decide on technology, priority of products produced, labour relations, how long to produce etc.. All are factors in the determination of how much industrial electricity is required for their production in British Columbia. Foreign staples producers are interested in manufacturing finished goods in their own countries (especially when they are vertically integrated and have their own manufacturing plants). Their resource processing facilities tend to expand by way of using more of the same natural resources. Therefore, their growth in British Columbia is limited by the available natural resources allocated to them by the government. As a result, planning a hydroelectric infrastructure for the staples production, in the absence of diversification, can become overplanned due to the limits of non-renewable resources.

The markets elsewhere are beyond the control of the regional government. Over-dependence on such markets substantially reduces the control of the provincial state over its accumulation process. The instability of such production cycles affects the planning of an electrical system's capacity. It can produce a substantial surplus of power in times of very low growth and during the saturation of supply in the staples production market.

Industrial Customers in British Columbia

In response to the "unplanned surplus" of electricity, former B.C.Hydro chairman Robert Bonner said:

Hydro was merely responding to what its corporate customers thought they would need. He said those industries could not have forecast plant closings and the general slump in the economy that resulted in a drop in the demand of electricity.²⁷

Norman Olson, the president of British Columbia Hydro and Power Authority, acknowledging in a similar response the lack of demand for power from the \$2 billion Revelstoke dam, indicated, "... the earlier forecast was based at least in part on firm inquiries from companies wishing to set up or expand their businesses and their use of electricity in British Columbia. He asks rhetorically: "Where are they now?"²⁸

The lack of promised industrial consumption and subsequent non-purchase was advanced by both the chairman and the former president of B.C.Hydro as a cause of the "unplanned surplus." This issue became a major focus at the B.C. Utility Commission Hearings.

J.R. Brassington in charge of B.C.Hydro's Special Power Contracts Department, which deals with bulk inquiries since

27 Russel Kelly, "B.C. Has Too Much Dam Power," February 14 1984. Photocopied article.

28 Albert Sigurdson, "B.C.Hydro foresees further cuts in capital projects as growth slows," *The Globe and Mail* September 26, 1983, p. B1.

1970, presented tables of 34 companies which were planning to expand their existing operations or start new accounts. To verify these tables, R. Overstall, a geologist and researcher on behalf of the Society for the Promotion of Environmental Conservation (SPEC), independently surveyed the inquiring companies. Both Overstall and Brassington concurred on many of their findings because the companies reduced their requirements within a four month period (October 1981 to February 1982). During these surveys, plans for establishing new industrial plants, or expansions of existing facilities, had either been canceled or were reduced by the following Canadian and foreign controlled companies:

Ferro-Silicon Smelter: Sumitomo/SKW Canada Ltd., Mitsubishi Canada Ltd., Mitsui & Co. (Canada) Ltd.; Coal Mining Expansion: Fording Coal Ltd., B.P. Canada Ltd., Petro-Canada Coal Division; Lead and Zink: Cyprus Anvil Mining Corporation; Stikine & Schaft Creek Copper: Teck Corporation, Kennco Exploration; Pulp and Paper: Eurocan Pulp & Paper Ltd., Canadian Cellulose Company Ltd., Doman Industries Ltd, and for pulp mill Chemicals: Canadian Occidental Petroleum.²⁹

There is no evidence that they were held responsible for not purchasing the electricity they had made firm inquiries for. Overstall (from SPEC) checked 85% of the capacity (1349 MW) of the companies which B.C.Hydro had indicated as

29 Exhibit 97: Table 1, titled "B.C. Hydro Bulk Power (1800 Series) Accounts Detail - Probable Electrical Projected Sales;" Exhibit 98: Table 2, B.C. Hydro 1981 Bulk Load Projections - "Other" Assumed Staging;" and Exhibit 96: Statement of Evidence of Richard Overstall (S.P.E.C.); these exhibits were presented to and filed by the B.C. Utilities Commission during the Site C Hearings on February 10, 1982, p. 4421.

inquiries (requests) by the companies, but found, 49% of those did not confirm (667 MW).³⁰ Mr. Brassington (B.C.Hydro) said in reference to the forecasts and revisions: "...some of the changes that SPEC made we would still take issue with." However, in general he concurred, since his revised forecast was even below SPEC's. He testified: "I would expect that Hydro would have to serve 561 [MW] within the decade."³¹ Upon revising and reconfirming with potential industrial customers, Hydro estimates were less than half the original forecast.

Hydro's outlook in the forest industry was also found to be overly optimistic. It had assumed a strong recovery "...in 1983 and 1984, namely with real growth in value added of 20.2% and 32.0% respectively, with major expansion in capacity from 1986 until the mid 1990s with seven new chemi-thermal mechanical pulp mills over that period."³² In contrast to the argument that price is very significant to industrial users, other Hydro witnesses argued that the higher prices of electricity will not be significant in the technological change to "thermal and chemi-thermal mechanical pulping" (2,400 GW.h or 73% of load growth in the forestry), since not electricity but "wood supply costs are a major concern."³³ This contradicts to some degree the government's 'electricity as a low-cost incentive to industry program.' When overly

30 BCUC *Site C Hearings*, February 10, 1982, Fort St. John, Mr. Overstall, Vol. 26, p. 4339.

31 BCUC *Site C Hearings*, Vol. 26, pp. 4421, 4481.

32 BCUC *Site C Report*, May 1983, p. 74.

33 BCUC *Site C Report*, May 1983, pp. 75,76.

optimistic industrial forecasts contribute to the over-building of infrastructure, then the costs are spread by way of rate increases over all consumers.

The B.C. Utilities Commission, not only questioned the B.C.Hydro forecasts, but also those of the Ministry of Energy, Mines and Petroleum Resources.

In cross-examination of the Ministry's forecasts one major area of controversy related to the primary metals and mining industries -- the number and timing of new copper, lead-zinc, ferro-silicon and aluminum smelters in particular.... The Ministry panel agreed that some of the assumptions in these areas, for example, those with respect to ferro-silicon smelters, may have been overly optimistic (10:1,602).³⁴

The inability of the provincial state to plan and produce the appropriate size of its hydroelectric system, when based on planning information extended by the industry, becomes apparent. Corporations in the major sectors of British Columbia's staples-dependent economy (e.g. forest products and mining) deny B.C.Hydro, the Ministry of Energy, and the government, the power to comprehensively plan for future consumption. The major contradiction between planning for the industry and the inability to supply adequate planning information are brought forward in the conclusions of the B.C. Utilities Commission. The Commission came to the following conclusions with respect to development policy in British Columbia:

34 BCUC *Site C Report*, May 1983, p. 74.

The evidence showed clearly that a major difficulty Hydro faces in developing load growth forecasts and hence system plans is in estimating the future new industrial loads. On the one hand, Hydro feels obliged to make provisions for such loads so that electricity supply does not constrain new economic development. On the other hand, since these loads are not committed, it is not clear to what extent they should be taken into account since new facilities might be built in anticipation of loads that never materialize.

This problem relates directly to provincial industrial policy and the extent to which the province wishes to encourage the development of electricity-intensive industry and to gear Hydro's planning to accommodate such development whenever it occurs.³⁵

The underutilization of hydro facilities, such as the Cheekeye-Dunsmuir projects (\$ 838 million) and the Revelstoke dam (\$ 1,921 million) which were built to a large part to accommodate industry, are very costly for British Columbians. Mr. Sheehan (B.C.Hydro's Executive Vice-President, Finance of Administration) testified that current rate increases are primarily driven by the cost of those two projects. By adding the Cheekeye-Dunsmuir transmission lines to Vancouver Island, B.C.Hydro added 2400 MW transmission capacity to handle a load forecast to be only 260 MW in fiscal year 1986/87 -- a utilization of only 10%. B.C.Hydro testified that "...this transmission capacity was based on load projections by the major industrial customers on the Island...."³⁶ The utility indicates, also, that the Revelstoke Dam (capacity 1843 MW) will not be fully used until 1992 for domestic purposes. In

35 BCUC *Site C Report*, May 1983, p. 300.

36 BCUC *Decision May 9, 1986*, p. 19. This fact was confirmed in a personal interview with Brassington on July 21, 1986.

the meantime, the dam's use is dependent on the export market in the U.S.

Size of the Surplus

The size of the surplus can be gauged by Hydro's application to the National Energy Board (the federal agency approving the export of electricity) in 1983 to export capacity and electricity for the years from 1 October 1984, to 30 September 1990. Since British Columbians do not need the Revelstoke dam for this period, B.C.Hydro applied for the total amount of firm export not exceeding 2,000 MW (a capacity greater than Revelstoke dam) and 6,000 GW.h (equivalent to the purchase of Hydro's electricity in all of British Columbia's pulp mills). Since B.C.Hydro could not predict if its competitors in the United States would have firm or interruptable power or energy to sell, the company applied for licenses to exchange, store, sell or transfer interruptable energy in the amount of not exceeding 15,000 GW.h (Nearly half of B.C.Hydro's total sales, firm sales would be deducted) and to loop, i.e. circulate (simultaneous import and export arrangement), the flow of power not exceeding 3,000 GW.h.³⁷ This requires increased interlinkage with the U.S., and Alberta grid system.

37 The National Energy Board of Canada, *In the Matter of the National Energy Board Act and in the Matter of an Application of British Columbia Hydro and Power Authority: To renew, with modifications, License No. El-128; El-130; El-127.* 1983, Volume 1, pp. 7,8,9.

The size of the hydroelectric system is usually described by its capacity to produce power. B.C.Hydro's operating capacity has grown to "a total name plate capacity of some 10,483 MW [Megawatt = 1000 Kilowatts]. As already indicated above, the highest one-hour demand ever recorded to the end of 1985 on Hydro's integrated system -- 6,816 MW -- occurred on 26 November 1985."³⁸ (under extreme cold and export conditions) Despite adjusted forecasts and supposed planning according to "customer sovereignty" conditions (where customers set the demand), the capacity is 35% above the highest peak ever recorded. This indicates not just a safety margin, but a substantial surplus capacity. The Burrard Thermal Plant (912 MW, replacement value \$1.4 billion) was to serve as an emergency power source in case low spring river flows would not fill the reservoirs or if British Columbia were faced with a draught. It has hardly been used. The Energy Minister, Stephen Rogers, commented on Hydro's surplus and the idleness of this plant: "Other utilities can't believe we have a plant like this just sitting there just in case we need it someday. It's like wearing a belt and suspenders."³⁹

38 B.C.Hydro, *B.C.Hydro: The Background*, "History," 1983, p.3. Shrum (1961: 27) indicated the estimated potential capacity of both rivers. "Capacity - During the period from 1968 to 1979 the Peace project could add 3,084 mw. of capacity to the British Columbia power-supply. During the period from 1967 to 1983 the Columbia project could add 4,220 mw. of capacity." The total capacity of the two rivers which was added to the system is very close to the capacity which has actually been added by 1986. Shrum's predictions under conditions of continued staples production were close to the actual events.

39 Vaughn Palmer, *The Sun*, Vancouver, November 6 1985.

Conclusion

In summary, planners, experts, politicians, industrial development officers, within B.C.Hydro, the provincial government, and industry have shaped the hydroelectric infrastructure of British Columbia. The building of such dams and the production of electricity requires solutions to complex planning problems. Both, unreliable information provided by industry and the absence of a clear government industrial policy direction led to substantial overestimates of industrial needs and contributed substantially to the overall surplus of power.

The contradiction between the output-oriented planning goals and the planning denied in a staples-dependent economy contributed substantially to the "unplanned surplus."

Chapter VI

B.C. HYDRO AND THE INTENSIFICATION OF STAPLES DEPENDENCE

Introduction

Before describing the 1980s state intervention in the development of hydro power, it will help to recall the interventions covered in previous chapters. It was argued that in recent decades the quantity and scope of provincial state intervention in the production of electricity has increased. It has done so in two ways, one, the state has intervened to expand the industry of building hydroelectric projects, two, it has expanded the production and distribution of electricity since the 1940s.

During the first three decades, two major interventions stand out. In the first, the B.C. Power Commission (1945) started taking over smaller utilities to proceed with the unprofitable rural electrification and the promotion of electricity for forest processing. The second intervention was characterized by several aspects: taking over the B.C. Electric Company, allowing the U.S. to regulate the Columbia River, developing the Peace River, to open the North, providing a dam-building industry as a relief for unemployment of the late 50s, and the promises of inflow of industrial and dam-building capital. Both interventions differed from the provincial state's allocative interventions (such as the allocation of forests, minerals, or dam sites). When allocating the provincial natural resources, the state did not

have to produce the forest areas, mineral deposits, or dam sites, but in order to build hydroelectric projects (the dams, the power houses, and switchyards), the state had to produce objects (build a dams). Therefore, the allocative bureaucracy was insufficient and a technocratic planning structure was required.

Allocations could be based on political considerations only, but in order to produce something, relying solely on politics was no longer sufficient. Decisions had to be informed by the actual output produced (the dam site, the size of dams, the market). Once the state became involved in production, the contradictions between planning versus the market grew. A market for the state-produced electricity consisted of the staples producers, but they disallowed comprehensive electrical load planning by the state, because their own production is directed from outside British Columbia, and because they had no obligations to use the electricity for which they made "firm inquiries" (a term used by B.C.Hydro forecasters which means firm requests).

The "surplus shock" and the recession in the 1980s presented a renewed threat to the accumulation process. Unemployment, lack of new industrial development, a surplus of power, and a prolonged recession puts pressure onto representatives of the state to respond. To reconcile these new conditions, the state intervened for the third time in a

major way. A qualitative change has taken place in the state's mode of operation. Since major projects are already produced, part of the state's internal technocratic structure (B.C.Hydro) has been transformed to allocate and generate electricity. In the interim, the state does need to build more infrastructure, because under conditions of overproduction the necessary mode of intervention resembles allocation, namely, the allocation of discounted surplus electricity to staples producers and purchasers in the United States.

In this foreign environment, B.C.Hydro as an agency of the state, experiences new complexities in fulfilling the state's accumulative functions. Unlike a vertically integrated multinational corporation (e.g. Alcan) which has control over resources, production (primary input products and consumer goods), and market share, the provincial state has delegated its control over resources. It has control only over an input product, and is uncertain how much its Crown corporation should produce for a foreign market. The questions about production arise in a new way. Should the state proceed with an intervention in a bigger way (e.g. build Site C for export), given its unreliable market share in the industrial consumption? The complexities of building dams and developing electricity as an exportable resource product are historically evident. Some of them are: competition from U.S. utilities, transmission problems of electricity, uncertain

revenues to pay state debts, and uncertain industrial consumption on a larger scale.

Third Intervention

In the 1980s a changing pattern of threats to the production of electricity has emerged in British Columbia: the surplus "power trap." This condition can be compared to what Watkins calls the "staples trap." Its characteristics are: specialization in the wrong kind of staple (electricity - the energy resource product); a weakening of the natural resource base; unemployment and underemployment; and the loss of initial opportunities for easy growth (Watkins 1967:64,63). The events leading up to the power surplus and the weakening resource base (described in previous chapters), combined with unemployment and underemployment, are characteristic of the situation in the 1980s. The average annual unemployment rate in British Columbia has dramatically increased in the 1980s (1980, 6.8%; 1981, 6.1%; 1982, 12.1%; 1983, 13.8; 1984, 14.7%; and 1985, 14.2%),¹ not only in the general population, but particularly among the employees and workers who planned and built hydroelectric dams.

Since the beginning of the Peace and Columbia hydroelectric projects more than 20 years ago, Hydro's construction activity has provided a significant share of total construction employment in B.C. - about 10 percent on average.²

1 Statistic Canada, 12 months calendar year average annual unemployment rate, catalogue No. 71-201.

2 B.C.Hydro, *Revelstoke Dam & Generating Station: Columbia River Power*, cited in the section "Economic Impact" on this promotional pamphlet, ISBN 0-7719-9914-3.

As the provincial staples producers required substantially less electricity, the industry of building dams came to a stop. Not only is the migrating construction force which moved from dam site to dam site within the province no longer required to build dams, but the employment of substantial numbers of hydroelectric experts, engineers, designers, draftsmen, and administrative staff comes to an end. This was the result of the third major intervention by the provincial state into the production of electricity in British Columbia.

The stopping of 10% of the construction activity in British Columbia, after socializing a work force around the building of dams, has had a severe effect on the construction labour force. The labour force estimates for the Revelstoke dam varied: While 790 workers were employed at the start of construction in 1977, this work force rose to a peak in 1981 of 3220 workers; upon completion of the dam in 1985, only 40 workers were required.³ This work force is only needed during the construction phase, thereafter 25 - 40 persons can operate and maintain a hydroelectric dam. The age distribution of this construction work force showed 70% were 31 to 55 years old.⁴ The family orientation of the workers was high, 74% were

3 *Revelstoke Demonstration Housing Project "Labour Force Estimates - Revelstoke Dam,"* p.39, source: Canadian Resourcecon Ltd..

4 Nicholas Vincent, "Field Actualities of an Impact Monitoring Program," Figure 1 : Construction Work force age Distribution, *Social Impact Assessment*, editors: Frank J. Tester, William Mykes (Calgary: Detselig, 1981), p. 255.

married, and 38% had families.⁵ They were no longer a work force of single men, but after 20 years of building dams, B.C.Hydro had created a middle aged family oriented work force. Their livelihood is substantially affected by the stoppage of construction.

Many other employees, not only engineers and construction workers, but construction managers, designers, white collar officer workers, equipment operators were part of an elite work force built up over the last twenty years who do not know what to do next. In five years, since 1980, the number of employees in B.C.Hydro has declined by 5,593 employees from 12,195 in 1980 to 6,602 by 1986.⁶ In 1977, the wages paid to employees made up 21% of B.C.Hydro's costs, whereas by 1986 they were forecast to be only 11% of costs. Finance charges have increased from constituting 35% of the costs in 1977 to a forecast by Hydro to be 45% of budget costs in 1986.⁷ These finance charges were an additional cause of the layoffs besides the primary cause of the layoffs which was Hydro's excess capacity.

5 Vincent, 1981, p.256.

6 *B.C.Hydro Annual Report 1984/85*, p. 15; the number of employees for 1986 is from exhibit 22, Hearing No. 5, January 10, 1986 submitted to the B.C. Utilities Commission by B.C.Hydro.

7 J.P. Sheehan (Executive Vice-President, Finance and Administration), *1984 Rate Application Volume 2 - Part2*, Supplementary Testimony 12 August 1985, a submission to the B.C. Utilities Commission as exhibit 2 (2), (entered January 6, 1986), Table, entitled "Distribution of Total Costs %," p. 12.

The over-building of hydroelectric projects had a severe effect on British Columbia's engineers. The Association of Professional Engineers of B.C. said "almost 15% of the associations 11,000 members - about 1500 people, including almost 500 former Hydro employees - remain out of work."⁸ The engineers have set up a charitable fund to help those facing economic disaster. Many former B.C.Hydro engineers have sued their employer for wrongful dismissal and won their cases. B.C.Hydro's Bob Martin, president of the Association of Professional Engineers of B.C., indicated in November 1985 that out "of 1,200 University of B.C. engineering graduates over the last three years, only about 400 are working full time." "We are advising them to go back East, or to go South. We tell them, 'You are Canadian engineers, you are respected with an accredited degree. Go and get some experience elsewhere and then when things start booming here you can come back.'" Martin then identified the interlinkage between trades and professions.

"Unless B.C.'s engineers are busy there is little hope of a resurgence among the trades and he added: 'If we don't move soon, this province is in real trouble. We have got to develop more secondary industry in order to inject a better balance into the economy.'"

But as he noted, the "smart money" is going into Lower Mainland office buildings.⁹ B.C.Hydro's chairman, Chester Johnson, on the other hand, would like to advance the building

8 Kim Bolan and Dave Margoshes, *The Vancouver Sun*, "Dismissal cost at Hydro to rise," February 5, 1986.

9 Alan Daniels, *The Vancouver Sun*, "Engineers have little to celebrate," November 15, 1985.

of another dam. In his address to the Management and Professional Employment Society's General Meeting, he wanted to give engineers and other professional employees some hope. He pointed to the differences between the government's and B.C.Hydro forecast estimates by saying: "the new forecast by the Energy Ministry has advanced domestic need for Site C by three to four years, they are more optimistic than us." About the layoffs he notes: "No one has enjoyed this process -- not me, the members of the task force, the consultants or the managers, but it had to be done as Hydro changed from a building to an operational mode."¹⁰ However this new "operational mode" goes beyond operating a utility -- marketing and allocation of electricity to various industries have taken on a new emphasis.

The Government and B.C.Hydro (Restructuring and New Policies)

In the interim, the government and B.C.Hydro changed the mode of intervention from a productive mode to a marketing allocative mode. In May of 1984, eight members on the 15 member board of B.C.Hydro directors were replaced by five corporate personalities and the permanent directorship of the Energy Minister Stephen Rogers.

"Mr. Rogers said the new appointments are the first step in a "new direction" being taken by Hydro, a Crown corporation set up in 1962 by former Premier W.A.C. Bennett. "As we are anticipating changes in

10 Chester A. Johnson, *Speech Notes Mapes Annual Meeting 18 February 1986*. (To forecast, the Ministry uses a industry sectoral approach to forecasting and Hydro maintains an "end-user" approach, i.e. asks industrial representatives).

the mandate and practices of B.C.Hydro," Mr. Rogers said, "the time is appropriate for a corresponding adjustment in corporate structure." "Obviously we are getting away from being an engineering firm to being a corporate, financial institution."¹¹

The change in direction,¹² given by means of political power over the Crown corporation, has substantially altered the internal mode of operation of B.C.Hydro.¹³ In the words of Hydro spokesman Peter McMullan: "We've changed from being a production company to an operating company." He also said that "layoffs are a part of 'an ongoing process' of restructuring the Crown utility."¹⁴ Chester Johnson who became chairman in January 1985, (formerly heading Whonnok Industries Ltd. and West Fraser Timber Co. Ltd.) is quoted as being "committed to a lean and efficient Hydro run along private sector lines." In his opinion this could be achieved "despite Hydro's status as a Crown corporation."¹⁵ Before the B.C. Utilities Commission he "...testified on the transition of the utility from a development and operating company to simply an operating company," but "subsequently modified his statement to include in "operating," the requirement that the utility be prepared to build and grow with the economic needs of the

11 *The Globe & Mail*, "Howe Street taking over Hydro, NDP charges," May 18, 1984, p.BC1.

12 Max Weber, *Economy and Society* (Berkeley: University of California, 1978 edition) p. 989.

13 The purposive rational mode of operation which is characterized by planning and engineering is transformed to a political input-oriented bureaucratic marketing. The output (building dams) does no longer determine the internal structure.

14 *The Vancouver Sun*, "B.C.Hydro cuts 40 head office positions," June 26, 1985.

15 Rod Nut, *The Vancouver Sun*, "Changes at Hydro spark questions," March 29, 1986.

Province."¹⁶ This is unlikely during the 1980s, because there is little domestic need for more power.

Backward Planning

Hydro "ends up planning backwards, attempting to create a demand for overcapacity it has built and doesn't know what to do with"¹⁷

The "unplanned surplus" of electricity in a staples economy is intensively marketed to staples producers. As the Energy Minister announced it to British Columbians:

"We will use the existing surplus of electricity to power the government's economic renewal program."¹⁸
(Stephen Rogers)

Hydro's Executive Vice-President Bill Best has introduced a new marketing policy which weds conservation to selective marketing opportunities. "Under the new policy Hydro tries to influence customers (primarily industrial and commercial) to convert to efficient use of electricity and gas where this will meet their energy requirements at lower longterm cost."¹⁹ Mr. Best then justifies the validity of this program by arguing that it spreads the potential rate increases over a larger base of sales.

16 B.C. Utilities Commission, *In the Matter of Application by British Columbia Hydro and Power Authority Decision*, May 9, 1986, p.9.

17 "First the Power then the Demand" *Energy Futures* Vol, No 5, June 1985, p. 4.

18 The Honorable Bob McClelland, Minister of the Ministry of Industry and Small Business Development, "Hydro Discounts to Attract Jobs" *BC Economic Bulletin*, Victoria, Spring 1985, p.8.

19 *B.C.Hydro Service Digest*, a B.C.Hydro information pamphlet mailed with the monthly bills, 16 October - 16 December 1985, p. 4.

The rationale in the "efficient" use of electricity coincides with the introduction of labour displacing automatic technology in pulp mills and saw mills. The efficient use of electricity is calculated on a percentage of end product cost basis. That is, B.C.Hydro's interest is in more sales to existing staples producers. The main argument put forward is that the introduction of new technology which uses more electricity will be more productive, because of the increased output. Since the new technology produces more staples -- electricity in the long run becomes a smaller component of the cost of the end product. Side effects, such as the displacement of workers, the speed of depletion of the forest resource, and diversification of the product (rather than the overemphasis of producing the same staple) are not part of this rationale. To implement this new conversion policy, engineers are turned into salesmen. Instead of applying electricity to the development of secondary industry, engineers become salesmen to the major users and fiber-per-acre consumers of forests.

Discount Power

One way to reduce the surplus is to offer special discount incentives. The provincial government passed two acts: one the *Critical Industries Act*, whereby with the help of discounts, electricity critical industries (closed sawmills, mines, etc.) were reinstituted (this act has no fixed level of discounts); two, the *Industrial Electricity*

Discount Act, whereby discounted electricity is used to attract new industries to British Columbia and expansions of existing industries are encouraged.²⁰ The eligibility of the *Discount Act* is limited to customers who are or will be large consumers of electricity (served at voltages of 60 kV and higher). A Hydro program called "*Turbine Turndown*" was "...initiated [in] February 1985 to provide a rate of 1.3 cents/kWh (about 55% discount) where this would be used to displace turbogenerators using oil."²¹ These new policies try to replace self-generation by saw mills, pulp mills, and other industries. In general, these discount programs do not include small innovative companies. Rather these policies show a preference for existing staples production in the chemical, pulp, and mining industry. B.C.Hydro's political liason officer explains:

The discounts are only aimed at exporting industries, because if discounts were available to industries supplying the provincial domestic market, this would create product pricing inequality and an economic imbalance within British Columbia.²²

20 The Critical Industries Act, *Statutes of B.C. 1985*, chapter 47, June 28, 1985. Industrial Electricity Discount Act, *Statutes of B.C. 1985*, chapter 49, July 11, 1985. B.C.Hydro; reference to the acts was also made in the submission to the British Columbia Utilities Commission, *1984 Rate Application*, Volume 2 - Part, Supplementary Testimony of J.P. Sheehan, 12 August 1985, p. 6,7, Sheehan is the Executive Vice President, Finance and Administration.

21 W.A. Bill Best, Senior Vice-President, System Development and Research, *Address to: "Industrial Customers of Northwest Utilities (ICNU) at Portland Airport Sheraton, 11 February 1986."* This document was circulated as a B.C.Hydro internal memo.

22 Personal conversation between myself and the the political liason officer of B.C.Hydro, August 14, 1986.

-Mining

In the mining industry, Lornex Mining Corp.'s Logan Lake mine-mill complex near Kamloops was the first to obtain 25% percent discounted electricity under the "Industrial Electricity Discount Act" to enable "Lornex to pump additional water to improve mineral recovery at the mine. The extra water will be used to process lower grade copper and molybdenum ore." The use of electricity, it is argued, keeps jobs longer, extends the ore body, accumulates extra revenue for B.C.Hydro (\$800 000), brings the mine discount savings, and money to the government (\$300 000). All this extra accumulation (employment of capital, labour and return in government revenue) is claimed to be the result of using discount electricity to pump water. Not only mineral staples producers but also North Vancouver chemical companies which supply pulp mills found uses for the discounted electricity.²³

Chemical companies

The Energy Minister Stephen Rogers announced that deals were signed with the government so "B.C.Hydro will supply ERCO, a division of Tennaco Canada Inc., with 10 megawatts of electricity a discount of 25% for two years ... to increase production of sodium chlorate, used mainly in pulp mills as a bleaching agent;" the extra product will be exported, and four to six jobs will be created. Likewise, the Canadian Occidental Petroleum Ltd. will get six megawatts of

²³ *The Vancouver Sun*, "Lornex gets break in electricity rates," (October 4, 1985) p. C8.

electricity for three years at a discount averaging 25 per cent "... to step up production of chlorine and caustic soda, also used as bleaching agents in the pulp industry. The extra production will go to Crestbrook Forest Industries Ltd." It is claimed by Rogers that the two deals will accumulate \$5.8 million for Hydro, and "1.2 million to provincial coffers."²⁴

-Pulp mills

The 25 per cent electricity discounts were also extended to large and small pulp mills, "the move will help the mills seek new export markets" said Rogers. The discounts for Western Pulp's mill in Port Alice exceeded 25%; Hydro spokesman Peter McMullan said; "the discount allows Port Alice to pay 1.3 cents per kilowatt hour, rather than the regular rate of four cents per kilowatt hour." He continued,

"this is a fairly common thing" ... adding that other companies that have used the discount include the B.C. Forest Products mill at Croften, the Canadian Forest Industries operation at Elk Falls and McMillan Bloedel mills at Harmac, Port Alberni and Powell River. ... McMullan said that Hydro has collected \$5.6 million in revenue.

Western Pulp president Ron Rogstad said the mills have also applied for another electricity discount from B.C. Hydro, similar to the ones given last November to a MacMillan Bloedel paper mill in Powell River and to a Crown Forest Industries mill at Campbell River.²⁵

²⁴ *Vancouver Sun*, "Two Chemical Companies Sign up Cheap Power Deal," 15 November 1985.

²⁵ Keith Baldrey and Gary Mason, *The Vancouver Sun*, "Hydro mill deal cited as conflict" January 21, 1986.

There was little evidence that the discounts diversified any part of the pulp and other staples production or attracted substantial industrial users of electricity to the province.²⁶

The surplus of electricity of the 1980s has been marketed within the province as in earlier periods with the lowest rates paid by the staples producers. The provincial state, in conjunction with its new allocation of low cost electricity to already existing production of the staples, is likely contributing to the faster consumption of the natural resources for which it has a mandate to be steward in the public interest. Increasing forestry production by means of discount electricity only intensifies the provincial staples dependence. As B.C.Hydro's own forecasts indicate ("Transmission Rate Sales," Appendix, Tables VIII, IX) recent industrial sales in the area of pulp & paper, wood manufacturing, and chemicals are growing slowly. Since loans for building the extra capacity cannot be paid with hope, the alternative for sales of the state's "unplanned surplus" is to market the electricity itself.

-Stand-by Staple

Electricity is a versatile source of energy, but constitutes a captured resource. A market of staples products

²⁶ The discount program, when coupled with staples production, appears to have been very accumulative since both, the Forest Minister Tom Waterland and The Energy Minister Stephen Rogers held shares in Western Pulp Ltd. Because of this conflict of interest, Waterland and Rogers needed to resign their ministerial positions (Keith Baldrey, January 21, 1986).

can be developed overseas, but new markets for electricity are confined to transmission via power lines within the province, or to locations outside the province.

In addition, such an industrial staple has no firm buyers, is subject to unpredictable price drops, is landlocked and therefore can only be sold to other Canadian Provinces or the United States. The provincial state is faced with threats of limits to growth of its present staples economy, while debts have to be repaid for dams and transmission lines. Their planning and construction had temporarily helped to continue the accumulation process in the staples economy. Because the state is functionally related to this process, it needs to either intervene to diversify production in order to improve the accumulation process, or opt for an even larger productive intervention, namely, to transform hydroelectric development and the generation of electricity into an export industry.

Forward Planning (Export power)

Previous export contracts have been signed with respect to hydroelectric developments on the Columbia and Skagit Rivers. Such agreements are made between the provincial government, and the federal governments in Canada and the U.S.. For example, the U.S. made a lump sum payment for using the Canadian Columbia River Valley to hold water behind two storage dams (Keenleyside, Duncan) and the right to exercise control over the release of water from the Mica and Revelstoke dams so it can be routed with maximum generation benefit and

flood control through the American Columbia riverbed and storage reservoirs.²⁷ Another British Columbia valley was to be flooded by the City of Seattle. The provincial government agreed to have the Skagit Valley flooded by raising the Ross dam 37 meters in 1967. However, due to popular pressure the valley was not flooded and an agreement was announced by the international Joint Commission, which adjudicates Canada-U.S. boundary disputes. This agreement "involves unspecified financial commitments by B.C. to supply the power that Seattle would have received had a hydro project south of the American border gone ahead."²⁸ These were special agreements and do not help to reduce the current surplus.

The power surplus and foreign export considerations were raised very early in the B.C. Energy Board's *Report on the Columbia Peace Power Projects* on July 31, 1961. More than 25 years ago the chairman of the B.C. Energy Board, Gordon Shrum predicted:

...since the minimum efficient development of either the Peace or Columbia will provide more power than British Columbia can absorb in the early years of the project, it is not economic to develop the two simultaneously without finding a very large market at remunerative prices outside the Province for this additional power. (p. 6)

27 Departments of External Affairs and Northern Affairs and National Resources, *The Columbia River Treaty Protocol and Related Documents* (Ottawa: Queen's Printer, February 1984) "It complicates the water-management task that one of Hydro's two river systems, the Columbia, is shared with the U.S..
"Vaughn Palmer "A Green Bundle For 'Blue Gold'," *The Vancouver Sun*, November 7, 1985.
28 Canadian Press (CP), Victoria "Skagit, Bgt", March 31, 1983.

During the 1980s recession, the employment conditions and economic circumstances and the need to develop hydroelectric potential are again used by the Social Credit government and B.C.Hydro as reasons to expand the hydroelectric infrastructure. Although officially, the hydro system was to have been built for the province, in 1983 the B.C. Utilities Commission found the efficiency criteria (optimum hydraulic production capacity) used by B.C.Hydro in the development of its system can ultimately only be justified "...by contemplating sales into the export market." Yet the Commission noted Hydro has not itself provided a forecast of probable export revenues.

The organizations representing industry in British Columbia have taken a position consistent with their own economic interests, but inconsistent toward B.C.Hydro. During the Site C Hearings (1981/1982), "...the Mining Association specifically referred to the need to allow for the expanding needs of the provincial mining and smelting industry" in its submission justifying the project on grounds of the economic potential of British Columbia.²⁹ In preparation of the Rate Relief Hearings, the Council of Forest Industries, the Mining Association, and the Electro-Chemical Interveners hired a forecasting consultant to prepare "a forecast of export surplus revenues of \$135 million in fiscal 1983 and \$146 million in fiscal 1984" in order to have export revenues

²⁹ BCUC *Site C Report*, 1983, p.123.

²⁹ BCUC *Decision*, February 1983, p. 105.

recognized as Hydro revenues and thereby reduce the industrial rate increases.³⁰ On the one hand, spokesmen for industry support expansion of B.C.Hydro to have ample electricity for their own industries; on the other hand, they want relief from prices through export electricity revenues which B.C.Hydro has to export since industries did not grow as predicted.

Building Dams for Export

In August, 1985 the provincial government announced that it would permit Hydro to build a new dam on the Peace River, near Fort St. John in northern B.C., if suitable firm contracts could be arranged to export the power to California on a long-term basis, perhaps 20 to 25 years.³¹

The focus of development is no longer provincial, but the development of hydroelectric power is determined directly in a foreign country, as is the case in many staples industries. Although, "Johnson said Hydro has enough surplus electricity now from its Revelstoke dam on the Columbia River to supply California's need for the next decade,"³² the rationale for building another dam is the same as forwarded before, the need to pre-build for eventual provincial demand. The idea of supply expansion for export, rather than domestic need, underlies the argument forwarded in Premier Bill Bennett's TV address in February 1986. He said: "B.C.Hydro is working hard to penetrate new markets. With the right kind of long-term

UC Decision, February 1983, p. 105.

31 B.C.Hydro, *B.C. Hydro: The Background*, a handout prepared for the public, March 31, 1986,

32 Peter Comparelli, "Fast Action Sought on Power Pact," *The Vancouver Sun*, September 17, 1985.

deal in California - and a fair price for our power - we'll be able to speed up the Site C project, which will have to [be] built some day in any case."³³ But before B.C.Hydro can plan its system for such markets, it needs to negotiate with U.S. utilities and agencies of the U.S government such as the Bonneville Power Administration.

The Bonneville Power Administration was formed in 1937 to market the energy from the Grand Coulee Project and all other federally constructed projects in the region. The establishment of BPA was in part a recognition of the potential energy from the Columbia River and the need to secure markets in the expanding region for that energy.³⁴

In a trade seminar held on the Expo grounds between Bonneville Power Administration, Southern California Edison, and B.C.Hydro representatives, Michael Peevey, executive vice-president of Southern California Edison said: "We want more trade with B.C.," and about Site C, he commented, "as long as the economies of Site C pan out we would buy more electricity from B.C." Even Bonneville's administrator Peter Johnson appeared warm towards Site C: "BPA and the utilities in the Pacific Northwest are very interested in Premier Bill Bennett's proposal to build Site C before it is needed in Canada,... but ... marketing of Site C power would necessitate even more capacity [the ability to transmit 7,900 megawatts]. One way to get it would be to complete the third AC line to

33 Doug Ward, "BCGEU President Halts Talks after Bennett's TV address" *Vancouver Sun* February 6, 1986.

34 Power Planning Committee, *Review of Power Planning in the Pacific Northwest 1981*, p. 29.

California...." "Hydro chairman Chester Johnson has said, he would like firm contracts with California ... so work on Site C could begin in early 1987."³⁵ California has enjoyed substantial savings by buying interruptable power without firm contracts. "Southern California Edison has estimated it saved about \$900 Million in 1983 by such purchases from the U.S. Pacific Northwest, Southwest and B.C. Hydro representing about 37% of their annual requirements."³⁶ The Press Release of the Bonneville Power Administration in Oregon (June 12, 1986) states whose interests are to be served in the Site C development study: "For BPA, a principal factor in the study will be insuring that any sale of Site C power be in the interests of Northwest ratepayers."³⁷ But, why would the United States customers be interested in having British Columbia develop Site C without granting long-term permission to transmit the power?

One reason is that governments and businesses like to reduce their financial risks. The price of building Site C, was indicated before the B.C. Utilities Commission. It "would cost 14 to 16 cents [per kilowatt hour] to produce Site C power."³⁸ This is very high, when compared with export rates

35 Rod Nutt, "U.S. prepared to back Site C dam on Peace," *The Vancouver Sun*, May 12, 1986.

36 Bill Best, *Address to Industrial Customers*, 1986 p.8.

37 Department of Energy Information of the United States of America, *Bonneville Power Administration*, released by BPA's Media Relations, Portland, Oregon June 12, 1986.

38 Marjorie Nichols indicates Hydro made those figures public before the B.C. Utilities Commission on October 31, 1984, *The Vancouver Sun*, April 5, 1986. Attempts to verify these figures with the B.C. Hydro Finance Department were met with a declining response, on the grounds that such information might

indicated by the 1985 B.C.Hydro Annual Report. They were 2.9 cents per KWh. The total cost of Site C is estimated to be \$3 billion. The United States and large corporations do not mind if somebody else will carry the financial and environmental burden for developing the costly generation of power. Bill Best, Senior Vice-President responsible for B.C.Hydro's System Development and Research, gave another very important reason why the United States would be interested in seeing Site C built. In his address to the Industrial Customers of Northwest Utilities at Portland Airport Sheraton on February 11, 1986, he said:

One of your association's Energy Planning Principles is that you '... advocate policies which promote an adequate and flexible supply able to support and encourage a growing economy, yet able to adjust for changing economic conditions or supply disruptions.'³⁹

In other words the industrial users in the northwestern United States enjoy the plentiful supply of electricity of the Pacific Northwest Utilities and B.C.Hydro. The policy direction adopted by the industrial customers indicates, they are not interested in firm contracts, since competition between overbuilt utilities assures low rates. Some already receive discounted rates from the Bonneville Power Authority. BPA has identified this condition in terms of the situation of its direct-service industrial customers. "The precarious situation of some of BPA's direct-service industrial

be used against the company (August 14, 1986).

39 Bill Best, Address to: Industrial Customers of Northwest Utilities at Portland Airport Sheraton, 11 February 1986, p. 10.

customers, primarily the aluminum industry that buys about one third of BPA's power, could have a big impact on BPA's overall load forecast [medium 1.3 % annual increase for 1984-2004]."⁴⁰ In order to keep up the demand for electricity from industrial customers, and to avoid industrial customers just dropping off the grid (by closing their accounts), if economic conditions change, BPA applied to the Federal Energy Regulatory Commission for rates that "...could be as low as 1.5 cents per kilowatt-hour or as high as 2.86 cents per kwh -- based on the price of aluminum."⁴¹

Foreign Environment Analysis

In this section, the production of electricity is approached as a semi-processed natural resource, in other words, like a staple. Succeeding provincial government policies have perceived river valleys as natural resources, which can be progressively depleted. Rivers are in this way seen as energy resources and the electricity they generate, when harnessed, becomes an "industrial staple." The 1980 energy policy statement indicates how the government sees its role:

We - the government on behalf of the people of B.C.
- are entrusted with the management of our energy
resources.

We still have considerable untapped hydro-electric
potential, and British Columbia is currently

40 Department of Energy Information of the United States of America, *Bonneville Power Administration*, Portland, Oregon, Media Relations Office, June 16, 1986.

41 BPA Press Release May 13, 1985.

investigating remote sites which could be used to meet the continuing growth in demand for electricity.⁴²

This is akin to the development tradition identified in the staples theory. It is similar to exploitation of natural resources whereby the hydroelectric potential of rivers is exploited by moving farther away from urban areas to build at the best power sites. In addition, with expectations of continuing growth, an overemphasis on the importance of the production of electricity together with what Watkins identifies as an "inhibiting export mentality" develops.

Although B.C.Hydro is a major institutional force in the province of British Columbia, its force is severely curtailed when it attempts to carry out the provincial state's accumulative functions (by means of land-locked industrial staple) in a larger foreign environment.

Although Shrum identified the issues surrounding the over-building of the hydro system twenty-five years ago, similar uncertainties about the export market have remained.

The only potential markets for British Columbia surplus power are in the United States Pacific Northwest, California, and possibly Alberta. The board has not conducted a detailed study of these potential export markets for surplus power from British Columbia, and hence no decision as to the economic feasibility of such export can be made at this time (Shrum 1961:6).

42 From the "Government of British Columbia's Energy Policy Statement of February 1980" cited in the B.C. Utilities Commission *Site C Report*, Vancouver, May 1983, p. 41.

The major issues of export revenue instability and the inter-linkage problem persist, although periodically substantial sales are made to the United States (from \$ 5 - \$250 million annually, from 1975 to 1986). Despite public pronouncements that exports keep rates in the province low, the B.C. Utilities Commission concluded the following from B.C.Hydro elaboration and the testimony of Mr. Sheehan:

Export surplus revenues are not forecast or considered in setting rates and the Authority's Board of Directors, including Ministers of the Crown, have annually approved setting rates on this basis.

B.C.Hydro does not believe that either prices or volumes of possible export sales can be predicted with sufficient accuracy to allow them to be taken into account in establishing domestic rates.

Placing reliance on highly uncertain and potential volatile export surplus revenue in setting revenue requirements would introduce an unacceptably high level of financial risk...⁴³

The risk of provincial state production of stand-by power for a foreign environment started with the integration of the transmission network. In order to export stand-by electrical power and provide a 5% reserve pool of power for the United States (which is to be reciprocal in case of failures), the British Columbia power grid is integrated with the U.S. Northwestern power grid to afford maximum coordination. The export rates vary according to the Northwest utility market and weather conditions. Binding sales agreements are made between dispatchers in the B.C.Hydro's Burnaby Mountain

⁴³ B.C. Utilities Commission, *Decision*, pp. 101-102, February 28, 1983.

Control Center and the dispatchers of U.S. utilities, the bill is mailed next day.⁴⁴

In the 1980s, surplus power continues to be exported on a stand-by basis and shows great fluctuations. "Export earnings are unpredictable ... swings in export earnings can be \$150 million from one year to the next."⁴⁵ This is largely due to U.S. demands and restricted access. The "inter-linkage" to the California BPA transmission lines was indicated as an optimistic possibility by Shrum in 1961:

...the rapid growth and size of the power loads in California and the plan to construct a power inter-linkage between the Pacific Northwest and California suggest that there is a good possibility that export of surplus British Columbia power to California would be feasible. (Shrum 1961:6)

This possibility has remained an unresolved problem. B.C.Hydro chairman, Chester Johnson, finds that the transmission line access is at times severely curtailed. He noted in 1986, that "sales in February have totaled only \$5 million."⁴⁶ The

44 Information obtained during a visit to B.C.Hydro's Burnaby Mountain Control Centre on February 7, 1986.

45 Hydro counsel Ken McKenzie's argument before the B.C. Utilities Commission in defense of keeping the interim rate increase, cited by Rod Nutt, "Major users demand rollback on interim rate for electricity," *The Vancouver Sun*, January 24, 1986.

46 The more extensive notes by Chester Johnson indicate under the heading of exports, that "revenue from the sale of surplus electricity to the U.S. reached \$248 million by 16 February, would have bottom line problems without this. Dry weather helped. Transmission line access now severely curtailed by BPA [Bonneville Power Authority]. Sales in February have totaled only \$ 5 million." *Speech Notes Mapes Annual Meeting* 18 February 1986.

export of surplus electricity has only been allowed on a stand-by basis by the BPA. Its Extraregional Access policy states:

BPA will not provide Assured Delivery to extraregional utilities.

BPA may, by contract, provide extraregional utilities limited access to Intertie Capacity. Such access, however, would be conditioned on such utilities' participation in the Pacific Northwest's coordinated planning and operation to a greater extent than in the past or agreement to provide other appropriate consideration of value to the Pacific Northwest. [Oregon, Washington, Idaho, a portion of Nevada, Utah, and Wyoming]⁴⁷

Since electricity is a captured resource, a land-locked staple, B.C.Hydro and the provincial government are increasingly dependent on other complex policies to transport such resources. British Columbia's Social Credit government currently stresses the "Commitment to the concept of a true north-south electricity grid" and supports this by pointing to \$250 million in export sales in the year ending March 31, 1986. This sale was due to unusually dry weather. BPA explains why it was importing this power in 1985. "Only four times in the past 60 years has the flow of the Columbia been lower during the month of July." "Last January, usually the wettest month of the year, was the driest January ever recorded."⁴⁸ BPA cut off supplying the nonfirm power sales to California, brought

47 U.S. Department of Energy, Bonneville Power Administration, *Near Term Intertie Access Policy*, (June 1, 1985) p. 10. A copy of this policy was obtained from the B.C. Utilities Commission, Exhibit 21, Hearing No. 4, entered by B.C.Hydro on January 9, 1986.

48 U.S. Energy Department, *Bonneville Power Administration*, Press Release, July 31, 1985.

all the water it can down from the Columbia River in British Columbia, thereby B.C.Hydro was able to obtain extra revenues from storage and export of power. To make up its own shortfall, B.C.Hydro imported some of Alberta's cheap coal-generated power.⁴⁹ This temporary power demand and access to power lines during 1985 was due to dry weather conditions rather than demand growth in the United States.

Futures

Because B.C.Hydro's production capacity in the interim has outgrown the provincial environment, the only way it can expand is within the Alberta or the United States environment. So far B.C.Hydro can be seen as having helped maintain the function of accumulation by productive intervention in the provincial environment. But how well will it perform the function of accumulation in the U.S environment? To answer this question and gain some insight it will help to use the this function's four basic principles and analyze B.C.Hydro's (that is an agency of the state's) performance in the United States environment with reference to exclusion, maintenance, dependency and legitimation.

49 U.S. Energy Department, *Bonneville Power Administration*, Press Releases July 12, 1986. "The applicant [B.C.Hydro] testified (transcript pages 938 and 982) that surplus energy is being purchased from Alberta to replenish its reservoirs which have been drawn down below normal levels by the increased export sales." "The B.C. Hydro/Alberta 500 kv intertie which was placed in service in early 1986 with a capacity of about 800 MW, has the potential to yield substantial benefits to both provinces." B.C. Utilities Commission, *Decision*, May 9, 1986.

Once B.C.Hydro expands into the foreign environment several obstacles can be noted: B.C.Hydro and the provincial government are excluded from the decision making process to a greater degree (inter-linkage); B.C.Hydro is unable to maintain a predictable source of income; the corporation and the government stake their dependence on becoming powerful through accumulation outside their environment; and they run into increasing difficulties in legitimizing the process. In spite of having adopted a new mode (allocative marketing) of operation, they will require an increased productive intervention to be maintained (e.g building Site C dam) in the new environment.

Exclusion (provincial/international)

The provincial state has no authority to order production or to control it in private foreign enterprises (U.S. enterprises) and has no right to supply its energy product (electricity) without permission of foreign state energy producers.

In the meantime, the Pacific Northwest has become a competitor for sales to California. The Bonneville Power corporation itself has a serious surplus of power. In its publication *Issue Alert* "Selling South: BPA Seeks Ways of Marketing Surplus Power to the Pacific Southwest" it reveals a history of surplus power and increased current surplus. Two decades ago, BPA made long-term surplus capacity sales contracts with California which are due for renewal in 1987

and 1988. BPA has developed additional power surpluses and became aware of this situation in 1982 and is since trying to negotiate contracts with California.

BPA would sell up to 2,000 megawatts of surplus capacity for the 20-year term, and would sell firm energy (based on forecasted BPA surpluses) on a rolling five-year basis. Currently it looks as though 1,000 megawatts of surplus firm energy might be available for the first five years.⁵⁰

The development of possible U.S. Northwest surpluses were not evident in provincial government and B.C.Hydro considerations. The development of a "surplus conflict" puts additional strain on the access and inter-linkage to California. Although the inter-linkage problem has a twenty-five year history, B.C.Hydro's surplus export continues to occupy a "backseat to access."⁵¹ In 1986, B.C.Hydro is excluded from the export (except to Point Roberts and Hyder) of firm electricity.

Bonneville's intertie access policy, adopted September 7, [1984] provides that under certain conditions access to the intertie is allocated among Bonneville and Pacific Northwest utilities based on their declarations of available surplus power, and that no other utilities may use the lines.⁵²

This policy was challenged by "...the Los Angeles Department of Water and Power, which is a major buyer of

50 U.S. Department of Energy, Bonneville Power Administration, *Issue Alert* "Selling South: BPA Seeks Ways of Marketing Surplus Power to the Pacific Southwest" B.C. Utilities Commission, File No. 14, no date.

51 Brian Lewis, business reporter for the Sun, on CBC AM Radio, 12:50 h, September 3, 1985.

52 American Press (AP) "Bonneville," Portland, Oregon, January 17, 1985.

surplus power transmitted from the Columbia River to California over three Pacific Northwest - Pacific Southwest power inter-linkage lines."⁵³ British Columbia is in effect competing with U.S. Northwest and Southwest utilities who have surplus capacity for access to California via the Pacific Northwest inter-linkage. The reason Los Angeles challenged this policy is that Bonneville's policy prevents purchase of power from B.C. Hydro at rates possibly cheaper than those charged by U.S. utilities. British Columbia's hydroelectric advantage which has been developed to benefit British Columbia's industry is thereby being used by Los Angeles. However, the access to British Columbia's cheap source of energy is restricted by Bonneville's access policy and arguments to gain maximum benefits for its constituents.

Bonneville contends that the policy is legal and necessary because the inter-linkage was built with taxpayers money to be repaid by Bonneville through sales of power and other revenue. Bonneville should, therefore, give a priority of access to itself and Pacific Northwest utilities to accomplish that.⁵⁴

Since B.C.Hydro is reported to have signed "a three-year contract with Los Angeles worth \$190 million to sell 3,000 gigawatt-hrs of power annually -- about half of the annual production of B.C.'s new \$2 billion Revelstoke dam,"⁵⁵ Bonneville is in effect a tollgate keeper for B.C.

53 A three-judge panel was considering this challenge, reported by the American Press (AP) "Bonneville," Portland, Oregon, January 17, 1985.

54 American Press (AP) "Bonneville," Portland, Oregon, January 17, 1985.

55 American Press (AP) "Bonneville," Portland, Oregon, January 17, 1985.

electricity: it charges B.C.Hydro for the transmission when such electricity is allowed to be exported to California. Chester Johnson agreed "other U.S. states are also chasing the California market, particularly Arizona and New Mexico. He said, although there has been "a lot of rhetoric" about BPA's inter-linkage policy, "things are not bad. We are just working out the bumps."⁵⁶ But the instability of exports persists. After the "export boom" of 1985, the spring of 1986 represents a "power bust." The exports for the first quarter of fiscal 1986/87 from April 1, to June 1, 1986 were Zero; no power has been exported for the entire three month period.⁵⁷

Maintenance (functional)

In British Columbia, power rates charged to industry are very low. "According to an international survey by Ontario Hydro, [B.C.] Hydro is an efficient low-cost producer of electricity ... the rate B.C.Hydro charges its industrial customers is the fifth lowest in the world after Sweden, South Africa, Hydro Quebec and Ontario Hydro. But University of B.C. energy economist John Helliwell cautions, ... 'the cost to the consumer is the wrong way to measure the efficiency of Hydro. ... Power should be priced at what it costs to build new dams to generate electricity.'⁵⁸ B.C.Hydro's Crown corporate

56 Jes Odam, *The Vancouver Sun*, "Bennett hails power breakthrough", September 18, 1985.

57 The response given to an inquiry about the current volume from the B.C.Hydro chairman's office on August 20, 1986. The Department of Marketing, Research and Planning at B.C.Hydro indicated, also, the lack of export sales: "we can't move a thing" (August 14, 1986).

58 Rod Nutt, *The Vancouver Sun*, "Changes at Hydro spark questions," March 29, 1986.

growth oriented policy however emphasizes capacity expansion and low cost supply.

The debt of the Crown corporation accumulated during the building of hydroelectric system⁵⁹ grew and "as at March 31, 1985, B.C.Hydro's outstanding long-term debt totaled \$9,469 million; of this amount \$4,666 million was payable in Canadian currency and 5,103 million was payable in U.S. currency (U.S. \$3,742). The effective interest cost on debt outstanding as at March 31, 1985, was 12.04%."⁶⁰ Particularly the export of money to the United States, such as the \$5,103 million to pay for the U.S. portion of which an increasing amount was used to pay for the excess capacity, constitutes the growing trend of regional disaccumulation. The dependence on U.S. loans is seen as a necessary obligation by the chairman of B.C.Hydro, who said: "When you've a Crown corporation, you have very heavy borrowing from foreign countries, like out of New York [sic]."⁶¹

As a result of provincial government guarantees for B.C.Hydro loans and a decline in tax revenue, the AAA credit rating could no longer be maintained. What determines the level of credit rating? As Timothy Crowell of Moody's Investors Services Inc., New York indicates, "'market conditions and the effects of the recession 'will be taken

59 Since 1961 the following dams were built: W.A.C.Bennett (\$.5 billion), the Peace Canyon Dam (\$.5 billion), Seven Mile, Kootenay Canal, Mica, Revelstoke (\$2 billion).

60 B.C.Hydro Annual Report 1984/85, p.14.

61 Canadian Press (CP), "Bonner Profile," January 12, 1985.

into account when Hydro's situation is reviewed. 'We tend to look ahead,' he said. 'But we remain concerned with the provinces financial situation; with falling tax receipts, and effect that it had on the need to borrow.'"⁶² The Moody's Investor's Service lowered B.C.Hydro's credit rating to Aa1, which implies higher interest rates.⁶³

Very expensive and heavily mortgaged dams have resulted in the export of large interest payments. The hope that buying excess electrical capacity with exported money (interest rates) would strengthen the province regionally achieved the opposite: it weakened the province's credit rating and brought about an export dependence on the United States.

Dependence (functional)

The provincial state's "power relationships, its very decision-making power *depends* (like every other social relationship in capitalist society) upon the presence and continuity of the accumulation process" (Offe 1975:126).

The provincial state itself was increasingly reliant on the direct accumulation process from B.C.Hydro in the early 1980s. B.C.Hydro's Annual 1984/85 Report indicates that water rates and taxes climbed from \$71 million in 1980, to \$299 million in 1985. At this time the state is attempting to continue the provincial accumulation process by relying on

⁶² Canadian Press (CP), "Hydro," April 12, 1983.

⁶³ B.C.Hydro Annual Report 1984/85, p. 14.

electricity exports to help pay for the debts it incurred. In the flow of interest payments, there is no inter-linkage problem to transmit (B.C.Hydro interest payments) regional capital outside of the country. The power of the provincial state is increasingly dependent upon helping California industries and possibly U.S. staples producers which compete with Canada by way of cheap power sales which are lower than provincial rates.

This process undermines the utility's provincial accumulation. Large purchasers of electricity in the province strive to obtain the same rates as the foreign utilities. West Kootenay Power and Light, one of the remaining private provincial utilities, owned by Cominco, has successfully sued B.C.Hydro to buy surplus electricity at the same rate as California utilities.

Legitimation

The state can only *function* as a capitalist state by appealing to symbols and sources of support that *conceal* its nature as a [staples-dependent] *capitalist* state (Offe 1975:127).

Politicians and B.C.Hydro representatives appeal to symbols of industrial progress and adverse effects are mitigated by impact experts. Development afterthoughts, such as the creation of a new category of discounted surplus electricity, are portrayed as attracting industry. Promises by the government are made for jobs in those industries attracted by cheap power, and the increase in construction

jobs is pointed out while dams are being built. The environmental and social impact is mitigated by resource consultants who study aquatic, forestry, fishery, and social service concerns. The imported technology of B.C.Hydro itself is used as an example of industrial development and progress, whereas little has changed. The kitchen hardware in the British Columbia hardware stores is as imported as the mega-hardware used on the W.A.C. Bennett Dam and in the Gordon Shrum Generating Station (on the Peace River).

The "power hunger" of California has often been cited as an absorber of any temporary industrial surplus of electricity. The offers to California of our power were made even before the major dams were built by W.A.C. Bennett during the opening ceremonies of B.C.'s new trade and travel centre in San Francisco (in August 1961). Gordon Bell, the Victoria Times Business editor, in his article "'Power Hunger' Claims for U.S. Misleading" raised the questions, to whether California and the Pacific Northwest really needed to import electricity from British Columbia. He found that it was rather the political reasoning of the Kennedy Administration which favored public power projects, often without enough attention to their economic rationale. He cites the following facts twenty-five years ago:

Even witnesses from the Bonneville Power Administration, an integral part of the vast U.S. public power system, were forced to concede in hearings before a House committee that, even under the most adverse weather conditions on record, power generating capacity of the northwest region would

fall short of estimated demand by no more than 1 per cent over the next half decade....

This was a tough point for Bonneville to concede because it has been, primarily, on the evidence of U.S. federal power spokesmen that the "power hungry" northwest and California image was built up.

This is politics and not economics

Bell then describes the plans of the giant grid being planned during the 1960s by Mr. Udall which was to link the large Northwestern and Southwestern utilities into a giant grid. In relation to future needs for B.C. power, Bell raised the big question:

Is it not possible that the claims of "power hunger" have been misleading in other than purely economic terms? Is it not possible that any power 'vacuum'-fictitious or real - will be filled by

the U.S. public power, leaving no room for import of foreign power?

Certainly it seems doubtful that Interior Secretary and his cohorts have done all their propagandizing on the need for power for the benefit of B.C.

Mr. Udall is pushing hard for a multi-million dollar western U.S. grid system....⁶⁴

Twenty-five years later in March 1986, Premier Bill Bennett upon the return of one of many visit to sell B.C.Hydro's surplus power to California found the following:

... that the Californians 'have become very very interested' in buying export electricity from B.C.

He said the Californians have recognized that one of the best options for their future energy needs is the 'safe, clean affordable' power from B.C.

He contrasted this perception with the relative ignorance about B.C. electricity when he first visited California to talk about it two years ago: 'There's been a remarkable change of view.'⁶⁵

64 Gordon Bell, *Victoria Times*, "'Power Hunger' Claims for U.S. Misleading?" August 12, 1961.

65 *The Vancouver Sun*, "Bennett finds Californians with fresh savvy - and... POWER HUNGRY," (March 8, 1986).

Conclusions

In response to the threat of a 1980s power trap, characterized by the specialization in the wrong energy product, a weakening resource base, unemployment and the loss of initial easy growth; the government and B.C.Hydro are intervening in the production of electricity in a major way. The building of dams has come to a halt, stopping 10% of British Columbia's construction, and more than 5000 employees were laid off.

This third major intervention consists of a transformation of the internal operations of B.C.Hydro and a reformulation of policy by the government and B.C.Hydro. The major direction of the policies with respect to the production of electricity are a combination of "forward" and "backward" planning. The "backward" approach is due to having produced the power first (surplus) which now is discount-marketed to staples producers (pulp mills, chemical companies and mines). This is an approach which intensifies staples dependence. The "forward" policy to escape the threat of the "power trap" advocates finding new export markets for the surplus and combines with that solution the developmental logic of viewing electricity as an energy resource (staple) to be exploited for export. This is seen to restart the industry of building dams, but extends and intensifies British Columbia's dependence. It does so, by way of development of increasingly remote river resources, in order to produce an industrial staple to be used in the manufacturing centers of California.

When examining the provincial state's functions of accumulation (exclusion, maintenance, dependence and legitimacy) in a foreign environment the uncertainties which arise are intensified. B.C.Hydro and the government are excluded from the decision making process to a greater degree (transmission of power, competition from U.S. utilities); they are subject to a less predictable source of income (interruptable sales in a fluctuating currency); an effort to maintain this process of accumulation becomes eroded by foreign debt payments and already lost engineering and labour skills; the political power dependence on appropriating export revenues as water taxes becomes undermined by local utilities and industries demanding the same rates as California, and the legitimacy of this process ("power-hungry" California, cheap residential electricity) becomes increasingly questionable.

Chapter VII

CONCLUSION

Summary

Out of the context of expectations that hydroelectric development would bring about a diversified secondary industry arose the question which was central to this thesis: Why did the provincial state's intervention in developing public hydro power, intended to diversify the industrial base, actually intensify British Columbia's staples dependence? This question was answered by way of four points of analysis: state intervention, the extension of the staples dependence, the planning for industrial power needs, and the intensification of staples dependence. It has been argued, that rather than contributing substantially to the development of secondary industry, B.C.Hydro, an agency of the provincial state, has become a major institutional force in extending and intensifying the production in the staples industries.

To elucidate the problem and find a partial answer a theoretical blend of staples theory (Innis, Watkins, Marchak) and key concepts of Offe's "Theory of the Capitalist State and the Problem of Policy Formation" were applied to understand the nature of productive state intervention (i.e. the building of dams) in a resource dependent capitalist society. Staples theory helps identify several developmental patterns of dependent staples production: its colonial origin, its state-supported continuation, and its recurring structural

conditions. In peripheral states, the accumulation process is substantially based on revenues from staples production. Offe's concept of the state is derived from the opportunities of accumulation the state needs to provide in order to maintain the economic system. To do so, it was argued, the state needs to intervene, not only by allocating resources, but also by turning water power into an electrical product. This development continued during the last twenty years and helped maintain the accumulation process.

The provincial state's interventions in the production of electricity started in 1945 with the B.C. Power Commission's purchase of small utilities to supply the rural areas with uniformly priced electricity and promote the industrial use of electricity in areas found unprofitable to serve by the larger private utilities. At the same time, the allocation of natural resources by the provincial state and the acquisition of large natural resource areas by large multinational corporations continued.

Subsequent to the second intervention, the take-over of the B.C. Electric (1961), the planning emphasis changed. B.C. Hydro's expansionary period was characterized by: mega-dams, cheap bulk rates, building before demand, opening the North, politicizing hydroelectric development, and building dams as an industry. During this period, the state had become increasingly involved in bringing hydroelectric projects into production and formulating policy to continue this

development. The "dual river policy" came to define the course of hydroelectric development during the 1960s, 1970s, and 1980s. By building dams B.C.Hydro became an institutional force which brought investment money into the province, created jobs during the construction and planning phase, promised industrial diversification, and improved reelection chances of the government. Instead of fostering competition with other regions by increased product innovation, the interventions (in the production of electricity and allocation of natural resources) served as a meta-level interregional competitive device for making staples products competitive.

B.C.Hydro was not merely a utility which supplied electricity. It was also the Crown corporation advancing the government's industrial development policy. B.C.Hydro's internal reports show several emphases: linking the natural resources to the electrical infrastructure, expanding the supply of electricity for forest processing, continuing the practice of "industrialization-by-invitation" (particularly in the promotion of mining and forestry), developing low cost electricity as an incentive to power intensive industries, and disseminating the notion that diversified manufacturing depends on large amounts of low cost electricity.

B.C.Hydro built large dams on the Columbia and Peace River with anticipation of attracting industries. No large smelting industries were attracted by the abundance of

electricity. Alcan and Cominco had developed their own dam sites for their smelting operations. The major remaining users of industrial electricity were the forest processing companies. During the expanding phase of B.C.Hydro, three major industries, "Wood Industries" (saw mills), "Paper and Allied Industries" (pulp and low grade paper), and "Chemical and Chemical Products Industries" (suppliers of pulp mills) constituted between 81% to 86% of the Crown corporation's manufacturing industry sales from 1961 to 1983. The purchasers in the remaining 17 industrial manufacturing categories constituted only 15% of Hydro's remaining sales to manufacturing industries in British Columbia. In other words, B.C.Hydro's industrial load was utilized primarily by the expanding forest processing industries.

The availability of electricity did not bring about a major diversification in the production of goods since the start of the major expansion of hydroelectric development in the 1960s. The dreams that electricity would become a catalyst to bring about secondary industry and consumer goods manufacturing has not become a reality. Spin-off industries from dam construction have not developed, except for government promoted tourist visits to the dam sites. Despite granting low electricity rates and resource royalties to staples producers, they did not use such incentives to substantially diversify their products.

Planners, experts, politicians, and industrial development officers within B.C.Hydro, the provincial government, and industry have shaped the hydroelectric infrastructure of British Columbia. Despite substantial efforts to plan the hydro-system, an "unplanned surplus" became apparent. Evidence was presented which indicates that the following contributed to this surplus: the unreliability of the industrial customers' firm commitments to expand their staples production, B.C.Hydro's inability to predict markets for industrial consumption, the treatment of electricity as a staple (exportable energy product), industrial optimism associated with big projects, and the absence of a clear government industrial policy direction.

The 1980s "power trap" is characterized by unexpected side-effects: the "surplus shock" due to the lack of predicted expansion by industry, the weakening resource base, unemployment and underemployment, the reduced growth in the consumption of electricity, and the staggering debt load were unanticipated by the technocratic planning approach. As a result of this 1980s "power trap," B.C.Hydro and the provincial government responded with the third major intervention, whereby the provincial government reduced B.C.Hydro's contribution to the provincial economy.

This third major intervention consisted of transformation of the internal operations of B.C.Hydro from a production to an operating company and a reformulation of policy by the

government and B.C.Hydro. The major direction of the policies with respect to production of electricity are a combination of "backward" and "forward" planning.

The "backward" approach stems from having produced the power first (surplus) which now is discount marketed to staples producers (pulp mills, chemical companies, and mines) for additional production. It thereby intensifies staples dependence. The "forward" policy involves seeking new export markets for the surplus and the development of remote hydro sites to produce electricity for export.

The provincial state's role in facilitating accumulation (exclusion, maintenance, dependence, and legitimacy) in a foreign environment are less certain than in a relatively simple domestic environment. B.C.Hydro and the provincial government are excluded from the decision making process to a greater degree. Interruptable and stand-by sales are less predictable sources of income. The process of accumulation can be eroded by foreign debt payments. The political dependence on appropriating export revenues carries a high degree of uncertainty, and it becomes more difficult to persuade the population that the process is legitimate. If dams are built solely for export, the price for electricity, the number of jobs, the interest rates, and export conditions (transmission line access) will be determined in the United States. In pursuit of such a policy the province intensifies

its dependency. When examining the 1980s "power trap" it becomes evident that the provincial state was unable, as Offe (1975:144) indicates, to carry out the functions of accumulation by means of productive intervention without paralyzing side-effects.

New Material

This thesis makes new material gathered in the B.C.Hydro library (e.g. reports and studies by the no longer existing Industrial Development Department) and other internal B.C.Hydro documents available to the general reader; for example, excerpts from reports which link B.C.Hydro to the promotion of the consumption of electricity in primary resource processing industries and the promotion of "industrialization-by-invitation." In addition, written material and new information was gathered by way of informal interviews with select B.C.Hydro employees in several departments: in the research department, Burnaby Mountain Control Center, marketing engineers, and quality control officers who buy B.C.Hydro equipment. My own personal experience in the planning process of hydroelectric projects (1966 - 1982), and very recent cross-examinations of B.C.Hydro executives before the B.C. Utilities Commission are part of the empirical information.

Utility of Result

This thesis is a contribution to understanding the repetition of historical staples-dependent development

patterns which are repeated in the productive interventions by the state, as well as a de-mystification of the dreams that the development of electricity produces substantial secondary industry.

The approach used may be applicable to the analysis of other provincial power utilities, such as Ontario Hydro, Hydro Quebec, and Manitoba Hydro. Or, it may be useful in other studies which investigate the productive interventions by the peripheral state (e.g. Expo 86, the productive input which was produced and operated by the state primarily for the tourist industry to keep the accumulation process going).

Limitations

The state in Canada has had a history of productive intervention in Crown corporations. Therefore, Offe's argument that "the quantity and scope of state intervention has increased to an extent that makes it justifiable to speak of a new phase of capitalist development in recent decades" (Offe 1975:125) needs to be reexamined in the context of Canadian Crown corporations which were established during the war and then sold off to the private sector.

Offe's theory stresses that "under conditions of *advanced* capitalism - the need for productive state activities" (Offe 1975:144) is a necessary function for accumulation, and that the scope of such productive interventions is increasing. However, the theory does not adequately cover the case of the state's over-production and subsequent need for allocation of

this surplus (the "staples trap" fits better in this case). Such an event requires the state, in the interim, to stop its productive activities (e.g. to stop building more dams). In order to cover such conditions Offe indicates two functional realities: one, the constant attempt to reconcile and make compatible the various functions of the state with its internal structure (e.g. change of departments and strategies), and two, that there "is neither visible nor to be anticipated a strategy that actually *does* reconcile these functions and thus achieve a balanced integration of the state and the accumulation process" (Offe 1975:144). The state therefore is seen by Offe to continuously readjust to new conditions. Only in that way does Offe's theory allow the adjustment from a productive mode to an allocative mode of intervention in an over-producing state (e.g. "backward planning" by discount-selling the surplus production). In other words, Offe does not offer a "reliable and workable strategy of 'system maintenance'" (Offe 1975:144). Beside limits in the application of theory in this thesis, the empirical categorization of industry within various levels of government made statistical comparisons difficult.

The categorization of industries varies within different levels of government, B.C.Hydro primarily categorizes industrial sales by the rates it charges ("transmission" for bulk users and "General" for "wood manufacturing"). The provincial government uses a variety of categorization ("sectors of manufacturing goods") and units (primarily

dollars and factory shipments). The only reasonable consistency was obtained with reference to federal statistic collected by Statistics Canada which are only as reliable as the reports given by the industry to the government.

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APPENDIX

FIGURE 1
DEVELOPMENTAL SCENARIOS

This schematic displays the three hydroelectric and staples economy development scenarios to illustrate more readily the nature of the problem under study.

DREAM

SCENARIO (KEEFER 1899)

PRE-HYDRO DEVELOPMENT	CONSIDERATIONS	EFFECT ON PRODUCT	ECONOMIC RELATIONSHIP
Present staples product plus elec. infrastr. planning	steady supply of cheap electricity	diversification of staples	staples independence through industrial evolution

EXTENSION (SHRUM 1961)
SCENARIO

PRE-HYDRO DEVELOPMENT	CONSIDERATIONS	EFFECT ON PRODUCT	ECONOMIC RELATIONSHIP
Present staples product plus dual river electrical infrastructure policy	more access to resources (roads, reservoirs), spin-offs, electricity as staple	continued staples production	staples dependence, temporary surplus electricity export

INTENSIFICATION
(1986) SCENARIO

PRE-HYDRO DEVELOPMENT	CONSIDERATIONS	EFFECT ON PRODUCT	ECONOMIC RELATIONSHIP
Staples product "unplanned oversupply," building for export	foreign capital debts, domestic. industrial power sales push, temp. jobs, electricity as staple	continued staples production	intensification: resource & electrical staples dependence, long-term export of variable U.S. revenue for constant debt payment, surplus induced dependence

FIGURE 2

GLOSSARY

Electrical Terms

HYDROELECTRIC POWER STATION: a power station which generates electricity from hydraulic sources. The water rotates turbines connected to generators.

CAPACITY: For example, a generator has a certain capacity (measured in watts) to produce power. In an electrical system the addition of these name-plate generator capacities is referred to as the total capacity.

POWER: Potential capacity.

ENERGY: available heat in electricity measured in kilowatt-hours, where one kilowatt-hour is equivalent to 3412.97 Btu.

WATT: the basic unit for measuring power.

WATT-HOUR: the basic unit for measuring energy.

KILOWATT (kW): 1000 watts.

KILOWATT-HOUR (kW.h): 1000 watt-hours.

MEGAWATTS (MW): 1×10^3 kilowatts

MEGAWATT-HOUR (MW.h): 1×10^3 kilowatt-hours.

GIGAWATT (GW): 1×10^6 kilowatts.

GIGAWATT-HOUR (GW.h): 1×10^6 kilowatt-hours.

MILL: one-tenth of a cent.

LOAD: the amount of electrical power delivered at any specified point on a system.

PEAK LOAD: the maximum average load during a time interval of specified duration (e.g., 20 minutes) occurring during a given period of time (e.g., a day).

DEMAND: the power (measured in watts) or energy (measured in watt-hours) required to supply the system load at any given time.

Source: Potential Benefits and Costs of Canadian Electricity Exports by Battle, Gislason, Douglas.

FIGURE 3

IMPORTED GENERATORS, TURBINES, AND ELECTRICAL GEAR
USED IN BRITISH COLUMBIA HYDROELECTRIC PROJECTS
MANUFACTURERS OR COMPANY OF ORIGIN

DAM SITE	EQUIPMENT	(No.) & COMPANY
Peace Canyon Dam (Site 1)	Generators Turbines	(4) Mitsubishi (4) Leningradsky Metallichesky Zavod (Emec Trading Ltd.)
Portage Mountain (Bennet Dam, Shrum Gener. Station)	Generators Turbines Switch Gear Giant Circ. Breakers	(5) CGE (3) Toshiba (2) Fuji (5) Fuji (3) Toshiba (2) Fuji Brown Boveri Brown Boveri
Seven Mile Dam	Turbines Generators Switch Gear Giant Circ. Breakers	(4) Mitsubishi (4) Hitachi ITE (Brown Boveri) Fuji
Mica Dam	Turbines Generators Switch Gear	(2) Hitachi (2) Leningradsky Metallicheski (4) Can. General Electric ITE (Brown Boveri)
Kootenay Canal	Turbines Generators	(4) Mitsubishi (4) Can. General Electric
Revelstoke	Turbines Generators Switch Gear	(4) Fuji (4) Fuji Mitsubishi

Source: B.C.Hydro, Quality Control & Inspection Dept., July 21, 1986.

TABLE VI
B.C.Hydro Sales Classified
in Industrial Analysis
1965-1976
Manufacturing

Year	(GW.h)				Total Mfg.
	Pulp & Paper	Chemicals	Wood	Other Mfg.	
1965	1 985.2	463.4	472.6	579.5	3 500.6
1966	2 441.7	692.5	535.7	643.9	4 313.7
1967	2 737.4	738.7	573.6	675.9	4 725.6
1968	2 994.1	891.4	627.6	715.2	5 228.2
1969	3 353.7	945.8	688.2	782.1	5 769.8
1970	3 288.7	968.1	739.5	810.4	5 806.7
1971	3 765.5	1 016.0	839.9	876.7	6 498.1
1972	3 846.6	1 078.4	985.3	920.8	6 831.1
1973	4 209.9	1 317.0	1 131.1	971.9	7 629.9
1974	4 173.9	1 277.0	1 124.5	1 016.0	7 591.4
1975	3 448.9	1 013.9	1 038.9	1 017.7	6 519.4
1976	4 489.4	1 376.3	1 274.7	1 051.5	8 191.9

Source: B.C.Hydro, Department of Marketing, Research, and Planning, (obtained in June 1986).

TABLE VII
Composition of Transmission Rate Sales
Historic & Probable Projections
14:27 Friday, January 31, 1986

	Pulp & Paper			Wood Manufacturing*			Chemicals		
	Avg No. Acc.	Energy Sales GW.h	%of Total	Avg No. Acc.	Energy Sales GW.h	%of Total	Avg No. Acc.	Energy Sales GW.h	%of Total

Historic									
1974/75	18	4,141	53.7	3	144	1.8	6	1,237	16.0
1975/76	18	3,398	49.9	3	129	1.9	6	975	14.3
1976/77	18	4,360	53.4	3	146	1.7	6	1,254	15.4
1977/78	18	4,336	51.1	3	154	1.8	6	1,349	15.9
1978/79	18	4,768	52.2	5	194	2.2	6	1,419	15.5
1979/80	18	4,693	50.9	6	205	2.2	6	1,372	14.9
1980/81	18	4,738	49.4	7	234	2.4	6	1,427	14.9
1981/82	20	4,271	45.7	7	223	2.5	6	1,241	13.3
1982/83	20	4,465	49.4	9	256	2.7	6	1,018	11.3
1983/84	20	4,604	49.7	9	293	3.1	6	986	10.6
1984/85	20	5,766	52.7	10	292	2.6	6	1,258	11.5
Avg. Annual Growth (%)									
10 Years									
74/75-84/85		3.4			7.3			0.2	
Projections									
1985/86	21	6,150	54.4	10	325	3.0	6	1,295	11.4
1986/87	21	6,625	53.9	13	370	3.0	7	1,370	11.1
1987/88	21	5,850	50.0	13	410	3.5	7	1,350	11.5
1988/89	22	6,125	49.5	13	410	3.4	7	1,385	11.2
1989/90	22	6,205	49.2	13	410	3.3	8	1,435	11.4
1990/91	22	6,205	47.2	13	410	3.1	8	1,555	11.8
1991/92	22	6,540	47.4	13	410	2.9	8	1,625	11.8
1992/93	22	6,815	47.4	13	410	2.8	8	1,695	11.8
1993/94	22	6,715	47.1	13	410	2.8	8	1,735	12.2
1994/95	22	6,990	47.4	13	410	2.8	8	1,775	12.0
1995/96	22	7,115	47.5	13	410	2.9	8	1,795	12.0
Avg. Annual Growth (%)									
11 Years									
84/85-95/96		1.9			3.1			3.3	

* Most Wood Man. sales are in the General Rate category

Source: B.C.Hydro, Dep. of Marketing, Research and Planning.

TABLE VIII
Composition of Transmission Rate Sales
Historic & Probable Projections
14:27 Friday, January 31, 1986

	Metal Mining			Mineral Fuels			Other Industrials		
	Avg No.	Energy Sales	%of Total	Avg No.	Energy Sales	%of Total	Avg No.	Energy Sales	%of Total
	Acc.	GW.h		Acc.	GW.h		Acc.	GW.h	
Historic									
1974/75	11	1,695	22.0	2	199	2.6	4	278	3.6
1975/76	11	1,715	25.2	2	211	3.1	4	282	4.2
1976/77	11	1,786	21.9	2	165	2.0	5	317	3.9
1977/78	12	1,947	23.0	2	227	2.7	5	331	3.9
1978/79	12	1,963	21.5	2	265	2.9	6	377	4.1
1979/80	12	2,085	22.6	2	259	2.8	7	430	4.7
1980/81	14	2,264	23.6	2	302	3.1	8	423	4.4
1981/82	15	2,637	28.2	2	326	2.5	9	443	4.7
1982/83	13	2,340	25.9	3	294	3.3	10	452	5.0
1983/84	14	2,279	24.6	5	367	4.0	10	468	5.1
1984/85	13	2,169	19.8	6	619	5.7	10	506	4.6
Avg. Annual Growth (%) 10 Years 74/75-84/85		2.5			12.0			6.2	
Projections									
1985/86	10	2,040	18.0	7	660	5.8	9	500	4.4
1986/87	11	2,325	18.9	8	745	6.1	9	505	4.1
1987/88	11	2,345	20.0	8	795	6.8	11	580	5.0
1988/89	12	2,340	18.9	8	805	6.5	11	920	7.4
1989/90	11	2,325	18.4	8	805	6.4	11	1,040	8.2
1990/91	12	2,585	19.7	9	825	6.3	11	1,140	8.7
1991/92	12	2,835	20.6	9	825	6.0	11	1,140	8.3
1992/93	12	2,995	20.8	10	855	5.9	12	1,190	8.3
1993/94	11	2,885	20.2	10	855	6.0	12	1,240	8.7
1994/95	11	2,885	19.6	10	860	5.8	15	1,390	9.4
1995/96	10	2,575	17.2	10	860	5.7	16	1,770	11.8
Avg. Annual Growth (%) 11 Years 84/85-95/96		1.6			3.0			12.1	

Source: B.C.Hydro, Dep. of Marketing, Research and Planning.

TABLE IX
Composition of Transmission Rate Sales
Historic & Probable Projections
14:27 Friday, January 31, 1986

Commercial				Total Sales	
-----				-----	
Avg No.		Energy		Avg No.	Energy
Accounts		Sales	%of	Accounts	Sales
		GW.h	Total		GW.h

Historic					
1974/75	1	20	.3	45	7,714
1975/76	2	96	1.4	46	6,808
1976/77	1	138	1.7	46	8,166
1977/78	1	135	1.6	47	8,479
1978/79	2	147	1.6	51	9,133
1979/80	3	173	1.9	54	9,217
1980/81	3	209	2.2	58	9,597
1981/82	3	198	2.1	62	9,339
1982/83	4	221	2.4	65	9,046
1983/84	7	267	2.9	71	9,264
1984/85	8	334	3.1	73	10,944
Avg. Annual Growth (%)					
10 Years					
74/75-84/85	32.5				3.6
Projections					
1985/86	8	345	3.0	71	11,315
1986/87	9	360	2.9	78	12,300
1987/88	11	375	3.2	82	11,705
1988/89	11	385	3.1	84	12,370
1989/90	11	395	3.1	84	12,615
1990/91	11	420	3.2	86	13,140
1991/92	11	420	3.0	86	13,795
1992/93	11	425	3.0	88	14,385
1993/94	11	425	3.0	87	14,265
1994/95	11	435	3.0	90	14,745
1995/96	11	440	2.9	90	14,965
Avg. Annual Growth (%)					
11 Years					
84/85-95/96	2.5				2.9

Source: B.C.Hydro, Dep. of Marketing, Research and Planning.

TABLE X
PROVINCIAL SUMMARY
1945-1965

TOTAL ELECTRICITY GENERATED WITHIN B.C.
(excludes exports, firm & surplus)

Year	ENERGY (KW.h millions)		Total %Inc.	Industry's Own Generation Breakdown *			PEAK-MW B.C.
	Utilities	Industry Own Gen.		Alcan	Cominco	Other	
1945			3,277.1				545.5
			0.6				
1946			3,319.1				577.8
			5.2				
1947			3,491.2				593.3
			13.0				
1948			3,946.6				674.0
			9.9				
1949			4,335.6				792.9
			12.2				
1950			4,866.2				879.0
			5.7				
1951			5,143.3				942.1
			5.5				
1952			5,424.3				1,050.0
			12.9				
1953			6,122.2				1,151.3
			13.6				
1954			6,953.5				1,301.0
			22.1				
1955	3,899.2	4,588.8	8,488.0	1,370.8	2,172.9	1,045.1	1,502.7
			18.5				
1956	4,279.5	5,775.7	10,055.2	2,513.5	2,207.4	1,054.8	1,880.1
			11.9				
1957	4,843.1	6,404.8	11,247.9	3,365.1	2,117.7	922.0	1,872.6
			6.0				
1958	5,468.1	6,454.7	11,922.8	3,314.8	2,180.5	959.4	1,981.8
			5.1				
1959	6,089.9	6,440.3	12,530.2	3,164.2	2,167.3	1,108.8	2,085.0
			9.3				
1960	6,431.8	7,258.1	13,689.9	3,706.3	2,315.8	1,236.0	2,229.9
			-2.0				
1961	6,801.7	6,619.4	13,421.1	2,773.0	2,543.4	1,303.0	2,399.3
			10.1				
1962	7,352.5	7,427.9	14,780.4	3,496.8	2,631.3	1,299.8	2,423.7
			5.7				
1963	7,872.5	7,752.7	15,625.2	3,593.1	2,696.4	1,463.2	2,633.9
			10.6				
1964	8,706.7	8,570.3	17,277.0	4,071.0	2,764.0	1,735.3	2,974.7
			9.7				
1965	9,969.4	8,982.6	18,952.0	4,189.6	3,087.8	1,705.2	3,137.7

Source: B.C.Hydro, Dep. of Marketing, Research and Planning,
(Obtained, June 1986).

* Excluding Sales to Utilities

TABLE XI
PROVINCIAL SUMMARY

1966-1984
TOTAL ELECTRICITY GENERATED WITHIN B.C.
(excludes exports, firm & surplus)

Year	ENERGY (KW.h millions)			Industry's Own Generation Breakdown *			PEAK-MW B.C.
	Utili- ties	Industry Own Gen.	Total %Inc.	Alcan	Cominco	Other	
1966	11,499.2	9,609.9	21,109.1 11.4	4,492.6	3,322.4	1,794.9	3,474.2
1967	12,640.5	9,994.9	22,635.4 7.2	4,892.6	3,193.1	1,909.2	3,781.1
1968	14,071.9	10,357.9	24,429.8 7.9	5,062.4	3,034.4	2,261.1	4,194.9
1969	15,580.9	11,024.7	26,605.6 8.9	5,550.5	3,096.3	2,377.9	4,340.5
1970	16,527.7	9,156.9	25,684.6 -3.5	3,741.8	3,206.1	2,209.0	4,548.0
1971	18,238.7	10,468.5	28,707.2 11.8	5,324.0	2,830.3	2,314.2	4,831.0
1972	20,700.0	10,100.0	30,800.0 7.3	5,400.0	3,000.0	1,700.0	
1973	23,300.0	9,900.0	33,200.0 7.8	5,700.0	2,080.0	2,120.0	
1974			34,000.0 2.4				
1975			33,300.0 -2.1				
1976			36,400.0 9.3				
1977			38,400.0 5.5				
1978			40,000.0 4.2				
1979			41,300.0 3.3				
1980			42,700.0 3.4				
1981			43,200.0 1.2				
1982			44,000.0 1.9				
1983			44,750.0 1.7				
1984			45,615.0 1.9				

Source: B.C.Hydro, Dep. of Marketing, Research and Planning. A handwritten note on the data sheet indicated the data from 1972-1982 are from Statistics Canada, Catalogue 57-204.

* Excluding Sales to Utilities

TABLE XII
MANUFACTURING INDUSTRY IN BRITISH COLUMBIA (1975-1983)
B.C., YUKON & N.W. TERRITORIES (1962-1974)
LARGEST PURCHASERS OF ELECTRICITY
(GW.h)

Year	Manufacturing Categories					%
	Wood Ind.	Pulp & Paper	Chemic. & Ch. Prod.	Total 3 Categ.	Total 20 Categ.	
1962	469	1,411	1,315	3,195	3,808	84
1963	521	1,362	1,336	3,219	3,866	83
1964	521	1,536	1,497	3,554	4,105*	86
1965	595	2,023	1,601	4,219	4,950	85
1966	667	2,435	1,908	5,010	5,830	86
1967	734	2,743	1,919	5,396	6,288	86
1968	773	3,020	2,100	5,893	6,852	86
1969	875	3,394	2,080	6,349	7,381	86
1970	934	4,093	2,013	7,040	8,105	86
1971	1,091	3,702	2,158	6,951	8,093	85
1972	1,245	4,248	1,188	6,681	7,857	85
1973	1,466	3,705	1,374	6,545	7,794	84
1974	1,410	3,561	1,362	6,333	7,564	84
1975!	1,404	3,319	884	5,607	6,910	81
1976	1,648	4,317	1,634	7,599	8,900	85
1977	1,868	4,339	1,416	7,603	8,916*	86
1978	1,982	4,492	1,464	7,938	9,372	85
1979	2,059	4,947	1,497	8,503	10,008	85
1980	2,061	4,801	1,575	8,437	10,042	84
1981	1,840	4,216	1,420	7,476	9,076	82
1982	1,776	4,453	1,202	7,431	8,964	83
1983	1,979	5,056	1,270	8,305	9,780	85

Source: Statistics Canada, Manufacturing and Primary Industries Division, "Consumption of Purchased Fuel and Electricity 1962-1974," Catalogue 5-3301-508, the data for this period include B.C., Yukon and Northwest Territories;

! the period of 1975-1983 originates from Catalogue 57-208 which is for B.C. purchases only.

* Note: The Totals for the 20 Manufacturing Categories had to be adjusted for reporting of high anomalous purchases (1964-1975) in the "Primary Metals Industry." The anomaly is likely due to Cominco reporting the purchase of power from its own utility West Kootenay Power & Light. Therefore, the "Total" was adjusted by allowing only 200 (GW.h) for the "Primary Metals Industry."