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REPORT OF THE TASK
FORCE ON ELECTRICAL
ENERGY COSTS IN THE NORTH

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REPORT OF THE TASK FORCE ON ELECTRICAL ENERGY

COSTS IN THE NORTH

I. INTRODUCTION

The Task Force on Electrical Energy Costs in the North was formed by the Minister of Indian Affairs and Northern Development on June 24, 1976 to study the financial obligations of the Northern Canada Power Commission (NCPC) in the hope of finding means of reducing its cost of financing and to examine other means of lowering future power rates for northerners less able to afford them. The Task Force included representatives of NCPC, the Treasury Board Secretariat, and the Departments of Energy, Mines and Resources, Finance, and Indian Affairs and Northern Development.

II. BACKGROUND

NCPC is a Crown Corporation which was established in 1948 to provide electric power in the Yukon and Northwest Territories. The Commission is required to provide power at cost, which includes amortization of debt, operating expenses and an amount sufficient to establish a contingency fund. Under the NCPC Act the Commission is required to recover its costs in the tariffs charged for electricity.

NCPC has incurred losses in the last three years and, to comply with its Act, it has raised its rates considerably. The reasons given for the increases were the general increases in the price of fuel and other operating costs and the large cost overruns at two of the Commission's new hydro power projects, Aishihik in the Yukon and Strutt Lake in the Northwest Territories.

Public reaction against the rate increases from the major centres in the north was strong and in January 1976 the Minister of Indian Affairs and Northern Development requested the Chairman of NCPC to report on the cost overruns at Aishihik and Strutt Lake and to submit NCPC's proposed rate increases both to the Public

Utilities Boards of each Territory for their review and advice, and to the Anti-Inflation Board.

NCPC commissioned R.N. Dalby, Chancellor of the University of Alberta, to report on the cost overruns and the conclusion of the Dalby report which is of concern to this study was that rate increases were necessary and should be introduced immediately.

The Utilities Boards made suggestions similar to those in the Dalby report and proposed changes in tariffs, not all of which could be adopted because of non-compliance with the NCPC Act.

At the request of the Minister of Indian Affairs and Northern Development, NCPC submitted all its proposed rate increases to the Anti-Inflation Board (AIB) in January, 1976. The proposal to increase, effective November 15, 1976, the wholesale price of electricity charged to Plains-Western Gas and Electric Company, the utility which serves Yellowknife, N.W.T. was also referred to the Anti-Inflation Board in July, 1976. As a result of this reference and numerous other appeals the AIB concluded that the rate increases at Yellowknife were highly visible and inflationary and suggested that some alternative solution be found to the proposed 100 per cent increase in the rates while recognizing that NCPC must operate on a self-sustaining basis.

III. WORK OF THE TASK FORCE

At the time the Task Force was established it was becoming apparent that NCPC was facing the possibility of having to introduce yet further rate increases, partly because of the delay imposed on the original rate increases, partly because of substantial reductions in revenue resulting from mine strikes in the Yukon, and partly for other operational reasons. NCPC's cash shortfall for the fiscal year

1975-76 was about \$4 million and a similar shortfall is predicted for the current fiscal year. Furthermore, the Commission's contingency fund has been reduced to practically zero. The strike at the Cyprus Anvil mine, which is still not settled, accounts for a loss of about \$7,000 per day to NCPC which is about 42 per cent of the Commission's Yukon revenues. NCPC's financial situation has been further aggravated by a shortage of water in the NWT this past summer resulting in the need to replace hydro power on the Yellowknife system with more costly diesel generated power. The additional cost to NCPC is estimated at between \$0.5 million and \$1.3 million.

In analyzing the problem of increasing power costs in the north and the financial difficulties of NCPC the Task Force examined three distinct areas.

- A. NCPC's short term cash shortage and measures that could be taken to alleviate the shortage;
- B. Current power rates to non-government domestic consumers, including those proposed for introduction in November at Yellowknife and a comparison with rates in other parts of Canada. This analysis included an examination of methods of applying a rate subsidy should such a subsidy appear warranted; and
- C. NCPC's longer term financial obligations, the impact these obligations will have on future power rates, and measures that might be taken to improve the Commission's financial position.

A. NCPC's Short Term Cash Shortage

It was recognized by the Task Force that there was a need for government action to alleviate NCPC's current cash shortage. Following an examination of the

Commission's financial situation, a submission was made to the Treasury Board requesting reimbursement by the Government to NCPC of \$1.6 million which the Commission had spent on investigations of power projects which had not been undertaken as provided under Section 14(3) of the NCPC Act. In addition, internal economies taken within NCPC were expected to provide about \$800,000. If additional relief is required, other methods which could be considered are a one-time grant, a one year interest free loan, a long term interest bearing working capital loan, or deferment of debt service charges, a method which is discussed later under NCPC's longer term financial obligations.

B. Analysis of Power Rates and Power Consumption

An analysis of the cost of power to domestic consumers in the north relative to costs in other areas of Canada was carried out. The analysis also included a comparison of average consumption and average bills between the two Territories and other areas in Canada. When considering the cost of power in the north there are already in operation programs to alleviate the cost of power to non-government domestic consumers in both Territories. In the Yukon an equalization payment keeps the residential rate for the first 300 kwh per month to 2.5 cents per kwh in Whitehorse and 2.0 cents per kwh in other Yukon communities. In the NWT a cross-subsidization scheme limits the rate on the first 300 kwh per month to 5.0 cents per kwh for domestic, non-government consumers served by NCPC. The results of the analysis are contained in the report which is attached as Appendix I.

The criteria which were used in assessing the results of the analysis were as follows:

1. Is the cost of power higher in the North than in other areas of Canada?
Have power costs increased significantly more in recent years in the North than in other parts of Canada?

2. Do consumers in the North consume more electricity? What governs the level of consumption?
3. Do northern consumers pay more than southern consumers because of higher rates and increased consumption?
4. Are subsidies warranted for any consumers in the Territories?

Based on these criteria the following conclusions have been reached.

1. Cost of Power

The conclusion as to whether or not northern domestic consumers pay more for power than those in other parts of Canada depends upon the southern location chosen for comparison and the size of the block of power being compared. In general, the cost of a small block of power in the North compares favourably with southern areas because of existing subsidies and equalization payments on the first 300 kwh of monthly consumption, but this advantage disappears for large blocks. In addition, costs to consumers in the Yukon are generally lower than in the Northwest Territories, because of the equalization payment on the initial subsidized block currently in effect in the Yukon which is funded by rebates on taxes paid by the private utility, Yukon Electrical Company Ltd. Currently the fund is at a level which will shortly force an increase in the rate of 2.5¢ per kwh in Whitehorse and 2.0¢ per kwh in other Yukon communities unless Government subsidy is provided. There is a similar but smaller rebate on taxes in the NWT. In the NWT a further indirect subsidy to the private consumer in small communities is provided by the Government paying higher rates than private consumers.

With regard to long term trends, most communities have experienced sharp increases in the past two years, but prior to that many communities

had enjoyed a long period with no rate increases. Over the period 1965 to 1976 Whitehorse has actually improved its cost position on the basis of a comparison of the costs in ten southern Canadian cities, but the relative position of Yellowknife has worsened.

2&3. Consumption of Power and Average Monthly Bill

Average domestic consumption in the Yukon exceeds average provincial and average Canadian consumption and consumption in the Northwest Territories is second highest for the same comparison. However, the high average in the two Territories is due to high consumption in the relatively few major centres where the majority of consumers are located, whereas consumption in outlying communities tends to be more in line with, or below the Canadian average.

A better understanding of consumption is obtained by examining the average bill paid in communities. Many small communities have average monthly bills in the range of other high cost areas in Canada as a result of low to moderate consumption and high average rates per kwh. Some large centres have somewhat higher average monthly bills but this results from significantly higher average consumption combined with significantly lower average rates per kwh.

Therefore, although the evidence is not conclusive, the main factors governing consumption seem to be the local cost of power and the socio-economic characteristics of consumers, rather than northern conditions. Higher average consumption per se does not appear to provide an adequate reason for subsidizing northern consumers since it would subsidize the more affluent members of the communities and create a misallocation of resources.

4. Subsidies

On the evidence to date, it is difficult to make a good case for across-the-board subsidies since communities with comparable costs and average consumption can be found in other areas of Canada. The comparison of average bills indicates that consumers in some of the small outlying communities of the North are paying some of the highest rates in Canada for relatively small consumption of electricity. Consumers with low average consumption may well include some of those in the group identified by the Minister as "...those less able to afford" increases in power rates. However, small consumers are already aided significantly on the first 300 kwh of monthly consumption. Therefore, it may be desirable to examine means of providing assistance to needy consumers by means other than power rate subsidies.

If subsidies are considered to be necessary, it would appear that the best method would be an expansion of the systems that are already in existence in both Territories, namely a subsidy on the initial block of power consumed. For example, the 300 kwh per month block of power that is now being subsidized could be extended to 400 or 500 kwh per month. Such a subsidy would benefit consumers who now use more than 300 kwh per month but there are consumers who use less than 300 kwh per month who would not benefit. Another approach would be to increase the existing subsidies on consumers of less than 300 kwh per month. However, this group of consumers pays very little for power now and an additional subsidy would not be very significant in terms of lowering living costs.

In the Yukon the subsidy on the initial block of power consumed is provided by the Territorial Government from a fund created by the tax rebate

accruing from taxes paid by the Yukon Electrical Co. Ltd. under the Public Utilities Tax Transfer Act. In the Northwest Territories the subsidy is a cross subsidy provided by the NCPC from its own revenues, not a subsidy provided by government.

Should a government subsidy be considered desirable it should be provided to the respective Territorial Government which in turn could undertake to pay the NCPC for a portion of the cost of an initial block of power provided to domestic consumers. This would enable the NCPC to follow normal business practices in its operations and avoid undue distortions of the rate structure. To provide a rough approximation of the cost of a subsidy, the example of increasing the subsidized block of power in the two Territories from 300 kwh to 500 kwh per month is used. It is assumed that the maximum anyone would pay for 500 kwh would be \$25.00. Under this scheme the annual subsidy is estimated at \$22,000 for the Yukon and \$231,000 for the Northwest Territories for a total of \$253,000 per year. This figure is roughly comparable to an estimate of \$239,000 for the amount of a subsidy required to bring the cost of a block of 500 kwh of electrical power for every non-government domestic consumer in the Yukon and Northwest Territories down to the cost of a similar block of power in Charlottetown, P.E.I.

Although there does not appear to be a good case for general subsidies for the cost of power to domestic consumers in the north, there may be isolated cases where some relief is justified. Fort Simpson is an example, where, because of generating capacity very much in excess of requirements, the cost of power to consumers is very high.

C. NCPC's Longer Term Financial Obligations and Future Power Rates

The analysis of current and projected increases in electricity rates in the Yukon and Northwest Territories shows that measures will be needed to improve the cash shortage of NCPC in this and subsequent years. Further, the analysis indicates that the measures required will involve fairly modest sums and that such amounts can be recovered by NCPC through modest per year rate increases in the next few years.

1. The past and present situation

In looking over the economic and financial picture of the Northern Canada Power Commission over the past ten years one can see that until 1974/75 the company had been able to balance its budget with very modest power rate increases if it needed any at all. Diagram 1 portrays the general picture with projections to 1981/82. From 1965/66 to 1972/73 we have shown the average cost of electrical generation for NCPC which was less than 2¢ per kwh until 1971. Costs and power rates started to rise from that time, and we have divided the average figures from that point on between the two territories.

Until 1973/74 the average revenues per kwh in each territory were sufficient to recover costs.* However in 1974/75, 75/76 and this year 1976/77, average revenues per kwh have been inadequate to recover costs. In 1974/75 NCPC suffered a loss of approximately \$1.4 million on its northern operations, rising to \$4.1 million in 1975/76. This year losses will be \$3.0 million to \$4.3 million.

* Included in average cost are debt and interest charges, as well as operating and administrative costs.

These losses were funded in 1975 by a significant reduction in retained earnings. By the close of 1975 NCPC had a \$1.2 million working capital deficiency. In 1975/76 NCPC was only able to survive financially by utilizing government loans to create working capital. Without financial assistance this year similar unavoidable practices will have to be resorted to. Clearly the financial situation is not sound.

From Table 1 it can be seen that in 1975/76 NCPC's losses were mainly attributable to its operations in the NWT, where its losses totalled \$3.4 million. The cost increases in that year are the result of increased operating costs, principally fuel and wages, from which the Yukon was, in large measure, sheltered because of its hydro capacity.

In the current financial year NCPC had budgeted to bring in rate increases to recover its anticipated costs. However, in the NWT present estimates indicate that there will be at least \$1.5 million loss on operations there. Revenue from sales of power will amount to \$18.1 million, and cost of power generation will be about \$19.6 million. The 1976/77 budget made no allowances for replenishment of working capital and thus future rate increases are necessary both (a) to put the NWT operation into a cost recovery position, (b) to replenish its working capital, and (c) to repay loans needed to recover current losses.

The Yukon situation is somewhat different to that of the NWT, as can be seen in Diagram 1. Whereas in the NWT extraordinary rate increases are currently needed to catch up to cost increases of last year, the cost increases in the Yukon are taking place this year. These are principally arising from the increased debt load created by the Aishihik project. The debt/interest payments due from the Yukon have risen from \$3.7 million 1975/76 to \$6.6 million 1976/77. (See Table 1).

Compounding the problem has been the Cyprus Anvil Mine strike which has effectively robbed NCPC of its chance to put its Yukon operations into a cost recovery situation this year. If the Anvil strike ends immediately the loss in the Yukon will be an estimated \$1.5 million. (See Table 2). If it continues to March 1977 it will rise to \$2.8 million. Thus, as in the NWT, further rate increases are needed in the Yukon to (a) put its operations into a cost recovery situation (b) to replenish working capital and (c) to repay new loans required to recover from the current year's loss. Data for the years 1972/73 to 1980/81 are tabulated in Table 1.

2. The future situation

(a) Yukon Territory

The largest element of cost in the Yukon zone consists of debt and interest payments on government loans. These payments are fairly predictable in the near future because they are based on current borrowing requirements and planned capital projects. Current projections indicate that there will be no further significant cost increases in the Yukon in the light of current capital plans for the next five years. If the capital budget were reduced, as has been indicated may be achieved by NCPC, then we can possibly look forward to small reductions in the average cost of power generation in the Yukon by 1979/80. (See Table 1).

Thus the long term situation is promising if no new large capital projects are necessary in the coming years.

The principal concern then is the impact of raising rates to recover 1977 costs when combined with the need to allow for a build-up of working capital, and to recover loans needed for current year losses.

Average costs in the Yukon in 1977/78 are predicted to be 3.2¢ per kwh, which are 10.3% higher than the current rates of 2.9¢.

The allowance for a contingency build-up in order to provide working capital is assumed to be ~~\$2 million per year~~ over 5 years to provide \$10 million total. Approximately \$857,000 per year will be needed to be raised from the Yukon zone to pay for this. This will raise rates to 3.42¢ per kwh, which is 17.9% higher than current rates. (See Table 1).

Adding on the debt charge to recover the current year's loss* adds a further \$182,000 to \$340,000, depending on the outcome of the Cyprus Anvil strike, raising the cost recovery rate to between 3.48¢ and 3.53¢. These would represent 20 - 22% rate increases next year. The situation is summarized below.

<u>Yukon Territory</u>	<u>per kwh</u>	<u>Increase over 2.9¢</u>
Current Average Rate	2.9¢	-
Cost Recovery Rate 1977/78	3.2¢	10.2%
Cost Recovery allowing for Contingency	3.42¢	17.9%
Cost Recovery with Contingency and current loss recovery.	3.48¢ - 3.53¢	20 - 22%

(b) The Northwest Territories

In Diagram 1 it is apparent that average costs of power generation are projected to increase very sharply in the predictable future in the NWT. However, the average picture is misleading in 1977/78 because of the high impact of the Taltson system on the total. This

* Assuming a 10% interest charge and amortization at 10% over 25 years.

system produces 37 per cent of all power in the NWT. Average costs for the Taltson system, the Yellowknife system and the combined "small communities", are shown in Diagram 2. The data are tabulated in Table 3.

The Taltson system faces very substantial cost increases next year with average costs increasing from 1.38¢ per kwh to 2.95¢, an increase of 114 per cent. However, this increase will be absorbed by Pine Point Mines since additional diesel generating plants were required to meet the requested needs of the mine. Further, it should be noted that this high percentage increase is on a very low base, the lowest in the north. Not allowed for in these figures is the contribution of Taltson to contingencies, which would amount to approximately \$467,000. This should not affect rates of residential consumers.

Power costs in the small communities of the NWT* are, as can be seen in Diagram 2, extraordinarily high, approximately 14¢ per kwh on average. Costs are predicted to increase by approximately 8 per cent next year. An additional \$294,000 cost to provide contingency funds would raise rate increases from 8 to 10 per cent for them.

The Yellowknife system faces increased costs 1976/77 to 1977/78 of 24.4 per cent, largely as a result of increased debt and interest payments from capital improvements on the Snare system. Current rate increases (November 1976) if augmented by a further increase of 11 per cent in July 1977 will put the Yellowknife system into a near cost recovery situation. Thereafter only modest rate increases will be needed to maintain cost recovery.

* ie. all communities outside the Taltson/Yellowknife systems.

Not included in the above cost figures for Yellowknife is an allowance for contingency build-up, nor repayment of current year losses.

Repayment of current year losses of \$1.5 million and a contribution of \$331,000 to contingency would clearly add a considerable burden (approximately \$512,000) to the rate increase already planned for Yellowknife in 1977.

3. Summary of the Future Situation

The NCPC's Yukon operations require short term assistance if they are both to operate on a cost-recovery basis next year and make a contribution to the build-up of contingencies and working capital, without being forced to raise rates significantly. Having overcome this short run problem the situation is projected to be stable.

In the NWT significant rate increases will be needed over the next two years in the Taltson system. However these increases are not expected to affect residential consumers. In the small remote communities of the NWT annual rate increases of about 8 - 10 per cent will be needed throughout the forecast period.

The Yellowknife system presents a similar problem to that of the Yukon. Significant capital additions have been made to the system and the Yellowknife consumer faces the prospect of further significant rate increases next year if the system is to be made economically viable. The need to recover current year losses and build up contingencies necessarily exacerbates the problem.

4. Options

(a) Do Nothing

In the current year NCPC will have a loss of \$3.0 million - \$4.3 million. If no action is taken by the Government of Canada this year then NCPC will presumably fund the deficit from long-term capital loans appropriated for capital projects as it did last year. If such loans are not available the company would be unable to pay its creditors, principally the Government of Canada.

Next year, 1977/78, looks more promising however, and, with rate increases of 10 - 11 per cent in Yellowknife, Whitehorse and the small communities, and full cost recovery on the Taltson system NCPC should be in an overall cost-recovery position. However the company would likely be short on working capital in 1977/78. In following years with modest rate increases (less than 11 per cent) the company should be able to rebuild its contingencies and working capital position.

(b) Provide a Cash Grant

The current year deficit of \$3 - 4.3 million could be assisted with a cash grant of approximately \$4 million. In combination with the repayment of research funds of \$1.6 million this money would both prevent a cash deficit this year and go towards build-up of the contingency. Next year NCPC, with modest rate increases of 10 - 11 per cent in Yellowknife, the small communities and Whitehorse, with full cost recovery in Taltson, should be in an overall cost recovery position. However, to provide a safety margin for unforeseen circumstances an additional \$1 million would be advisable, bringing the cash grant to \$5 million.

(c) Loan Repayment Deferrals

In view of the projected financial picture of NCPC, with only modest rate increases needed in Yellowknife and Whitehorse after 1977/78 the Government of Canada could assist the current year problem by permitting a deferral of payments of interest and debt to later years. Effectively this means providing NCPC an interest bearing overdraft which it will repay from future revenues. Such a scheme would not need application for the small communities nor Taltson.

(i) Yukon

This year there is a predicted shortfall of between \$1.5 million and \$2.8 million. If this were carried over to 1977/78 and attempted to be funded, it would create the need for large rate increases. However, if it were carried forward two years, allowing both for interest on the deferrals and the need for contributions to contingencies, then with power rate increases of approximately 10 per cent both next year and in 1977/78 the overdraft can be financed by NCPC.

The calculations are shown below: -

		<u>Anvil Strike Stops</u>	<u>Anvil Strike Continues</u>
<u>1976/77</u>	Loss	\$1.5 million	\$2.8 million
	Loan deferral needed	<u>\$1.5 million</u>	<u>\$2.8 million</u>
 <u>1977/78</u>			
	Rate increase to 3.2¢ per kwh provides		
	Revenues	\$10.214 million	\$10.214 million
	Costs	<u>\$10.100 million</u>	<u>\$10.100 million</u>
	Gain	\$0.114 million	\$0.114 million
	Contingency provision	\$0.857 million	\$0.857 million
	Loan deferral needed	<u>\$0.743 million</u>	<u>\$0.743 million</u>

1978/79

Costs	\$11.1 million	\$11.1 million
Contingency provision	\$0.875 million	\$0.875 million
*Repayment of 1976/77 deferral	\$0.201 million	\$0.375 million
*Repayment of 1977/78 deferral	<u>\$0.082 million</u>	<u>\$0.082 million</u>
Total revenues needed	<u>\$12.258 million</u>	<u>\$12.432 million</u>
Rate needed to generate these revenues	3.50¢ per kwh	3.55¢ per kwh
Increase over 3.2¢	9.7 per cent	11 per cent

The loan deferrals would need to be \$1.5 to \$2.8 million this year and \$743,000 next year under this scheme. Note that full provision for contingency funds has been built into the system which would assist the working capital dilemma.

(ii) Yellowknife

Current year losses of \$1.5 million can be financed through loan deferrals, while making allowance for contingency build-up, if they are spread over 4 years. Rate increases of approximately 10 per cent per year in this period would be necessary. However the actual annual value of the deferrals, after this year is fairly small.

The following represents the situation: -

Yellowknife Deferrals

Current year loss	\$1.5 million		With 10 per cent interest over 4 years
Loan deferral needed		\$1.500 million	\$2.196 million

*Carrying interest of 10 per cent per annum. The debt then amortized at 10 per cent over 25 years.

1977/78			
Average rate of 4¢ provides revenues	\$5.292 million		
Costs 1977/78	<u>\$5.461 million</u>		
Loss 1977/78	<u>\$0.171 million</u>		With interest over 3 years
Contingency provision	\$0.331 million		
Total deferral Needs		\$0.502 million	\$0.668 million
1978/79			
Rate increase to 4.4¢			
Revenues	\$6.164 million		With interest over 2 years
Costs 1978/79	<u>\$6.063 million</u>		
Loss (Gain)	<u>\$(0.101) million</u>		
Contingency provision	\$0.331 million		
Total deferral need		\$0.230 million	\$0.278 million
1979/80			
Rate increase to 4.8¢			
Revenues	\$7.250 million		
Costs 79/80	<u>\$6.839 million</u>		
(Gain)	<u>\$(0.411) million</u>		
Contingency provision	\$0.311 million		
Gain	<u>\$(0.100) million</u>		
Deferral need		-	-
1980/81			
Total deferrals brought forward 4 years			<u>\$3.142 million</u>
Costs 1980/81	\$7.748 million		Amortization of Above
Contingency provision	\$0.311 million		\$0.346 million
Amortization of deferrals	<u>\$0.346 million</u>		
Total revenues needed	<u>\$8.405 million</u>		
Rate to recover these revenues	<u>5.3¢ per kwh</u>		
Increase over 1979/80	9.5 per cent		

(Cost data provided by NCPD)

It can be seen that loan deferrals of \$502,000 and \$230,000 together with current losses of \$1.5 million could be financed through 10 per cent rate increases over the next four years. Throughout the

analysis the amortization terms have been taken to be 10 per cent over 25 years. Allowance for full provision for contingencies has been made in the calculations.

(d) Combination of Above

A third method of providing assistance to NCPC might be to provide a combination of cash grants with loan repayment deferrals. If a cash contribution of \$2 million to the contingency were made this year then this would automatically reduce the amounts required to be deferred in this and future years. The unavoidable and substantial revenue losses accruing from the Yukon mining strikes and the Snare system water shortage should be taken into account in considering this option.

(e) Summary of Options

To do nothing this year is not a recommended option because it will either force NCPC to misuse capital funds or not repay its debts.

The cash grant option would effectively get rid off the current year loss problem, as well as permit future build-up of working capital and contingency funds via modest (10 per cent) rate increases throughout the system (with the exception of Taltson).

The loan deferral system is workable and involves fairly modest sums. Future rate increases of approximately 10 per cent per year over 2 years in the Yukon and over 4 years in Yellowknife would be required to finance the scheme.

D. Excess Capacity

NCPC has suggested that the Federal government should permit debt extension on unused capacity in the NCPC system beyond normal protective levels. The Commission has also suggested that existing financing arrangements cannot be applied for repaying major new hydro developments without tripling or quadrupling the power rates. The reason for this is that the initial demand on such a development would represent only a small percentage of the ultimate capability of the plant.

In southern Canada the element of protection is usually about 120 to 160 per cent of the peak load. NCPC consider that the level of protective capacity in the north should be about 2.5 to 1 for the following reasons:

- transportation problems and lack of easy access to many northern communities;
- lack of a power grid system in the north.

Although the need for additional protective capacity in the north is recognized, it is a real cost and whether or not NCPC's debt arrangements should be adjusted to take this factor in consideration is questionable.

A better case can be made for adapting different financing arrangements for major new hydro developments (including transmission lines) in the north. In the Yukon, for example, a review of the inventory of hydro sites indicates that a development in the order of 75 to 100 megawatts would provide the best long term stable power in the area. Since initial demand would represent only a small percentage of the capability of the plant it has been suggested that annual debt repayments should be based on the percentage of the total capacity being utilized, allowing for a normal protective reserve. The concept is considered to be worthwhile and should

be examined in detail when major new hydro developments are under consideration. Amendments to the NCPC Act might be required to implement such a procedure.

IV. CONCLUSIONS

- A. The analysis carried out by the Task Force does not show that northern residents are significantly worse off than many residents of southern Canada with respect to the cost of electric power. Therefore it is difficult to make a case for additional subsidies, when equalization and cross-subsidization plans are already in existence to reduce the cost of the first block of power to northern residents. There may be isolated cases, however, such as Fort Simpson where rate adjustments for the sake of equity may be required. The NCPC should examine these situations and submit proposals for the consideration of the appropriate Public Utilities Board.
- B. Should it be considered that further subsidies might be desirable to assist those most in need, it is concluded that the best approach would consist of a subsidy channeled through the appropriate Territorial Government and directed at the first block of power supplied to domestic consumers. This could supplement or replace the present system of cross-subsidization and equalization.
- C. With regard to NCPC's short term cash shortfall and longer term financial difficulties, measures will be needed to improve the situation in order that power rate increases can be kept within reasonable limits. However, the measures that are required will involve fairly modest amounts of money and such amounts can be recovered by rate increases of 10 to 11 per cent

per year over the next few years. Rate increases of this size are not out of line with what is occurring and expected to occur in southern Canada. For example, the Nova Scotia Power Corporation has applied to the province's Public Utilities Board for a rate increase of up to 65 per cent for all classes of customers. In Ontario the Chairman of Ontario Hydro recently announced that Ontario customers can expect rate increases of at least 22 per cent per year over the next few years.

Of the two options which were considered for providing financial relief to NCPC, namely a cash grant or loan repayment deferral, the latter is considered to be preferable provided the substantial revenue losses incurred as a result of the Cyprus Anvil strike and the Snare system water shortage are considered as costs within the responsibility of the NCPC to absorb as contingencies. This option does not involve a cash outlay on the part of the government, but a deferral of loan repayments which are repaid in later years at interest. There was general agreement from Task Force members that loan deferral would be an acceptable procedure. Such a scheme would be applied to the Yukon and Yellowknife systems but not to the Taltson system nor to small communities. In the Yukon system estimated loan deferrals would need to be from \$1.5 million to \$2.8 million in the current year (depending on the Cyprus Anvil strike situation) and about \$0.743 million in 1977-78. In the Yellowknife system estimated loan deferrals would be \$1.5 million in the current year, \$0.5 million in 1977-78 and \$0.23 million in 1978-79 with repayment commencing in 1980-81. The cash shortfall in the Taltson system can be met by large increases in rates to Pine Point Mines Limited with modest increases to the communities of Fort Smith and Fort Resolution. The situation

with respect to rate increases in both Territories is expected to stabilize within the next two or three years if the suggested rate increases and loan deferrals are implemented.

- D. It is evident from the work of the Task Force that hydro-electric grid systems in the Territories provide the best possibility for stable power rates. However, the provision of such systems at this time may require an investment in a water storage facility, plant capacity, or high voltage transmission lines greater than that required to meet short term forecasts. The Government should consider means for financing such future plants which will not charge growth potential to current consumers.
- E. Given the evident advantages of hydro-electric plants in the Territories particularly in light of escalating fuel and labour costs for thermal plants the NCPC should consider the installation of small hydro-electric plants in isolated communities where practicable.

V. RECOMMENDATIONS

It is recommended that:

- A. No general subsidies, other than those currently provided by the YTG through equalization payments in the Yukon or by the NCPC through cross-subsidization, be granted to domestic consumers of electrical power in the Yukon and Northwest Territories;
- B. Where the cost of power in certain communities e.g. Fort Simpson appears to be unreasonably high, suitable rate adjustments could be proposed by the NCPC to the Public Utilities Boards for advice;

- C. Loan deferrals as described under CONCLUSIONS be granted to NCPC to meet current cash shortfalls and to smooth rate increases over the next two to four years.
- D. As a condition of loan deferrals, rate increases should be sufficient to cover all costs, meet any unexpected events, build up a contingency fund, and provide for the repayment of accumulated deficits at 10 per cent interest over 25 years. Short of unforeseen developments this should result in annual increases in the neighbourhood of 10 to 11 per cent over the next 3 to 4 years;
- E. In determining the actions required under Recommendation D, NCPC should examine the possibility of renegotiating contracts with the Cyprus Anvil mine and other major power users, with a view to putting them on a "demand charge" basis;
- F. NCPC be encouraged to implement capital economies and make provision for maintaining its contingency fund at the approved level in future years;
- G. No action be taken with respect to NCPC's suggestions that the Federal government permit debt extension based on unused capacity in the NCPC system beyond normal protective levels. Financing proposals for future major power developments should be looked at on their merits;
- H. The Minister make a suitable press statement, explaining the need for rate increases but emphasizing that assistance to NCPC in the form of loan deferrals will keep the amount of these increases within reasonable limits, consistent with what is happening in other parts of Canada; and

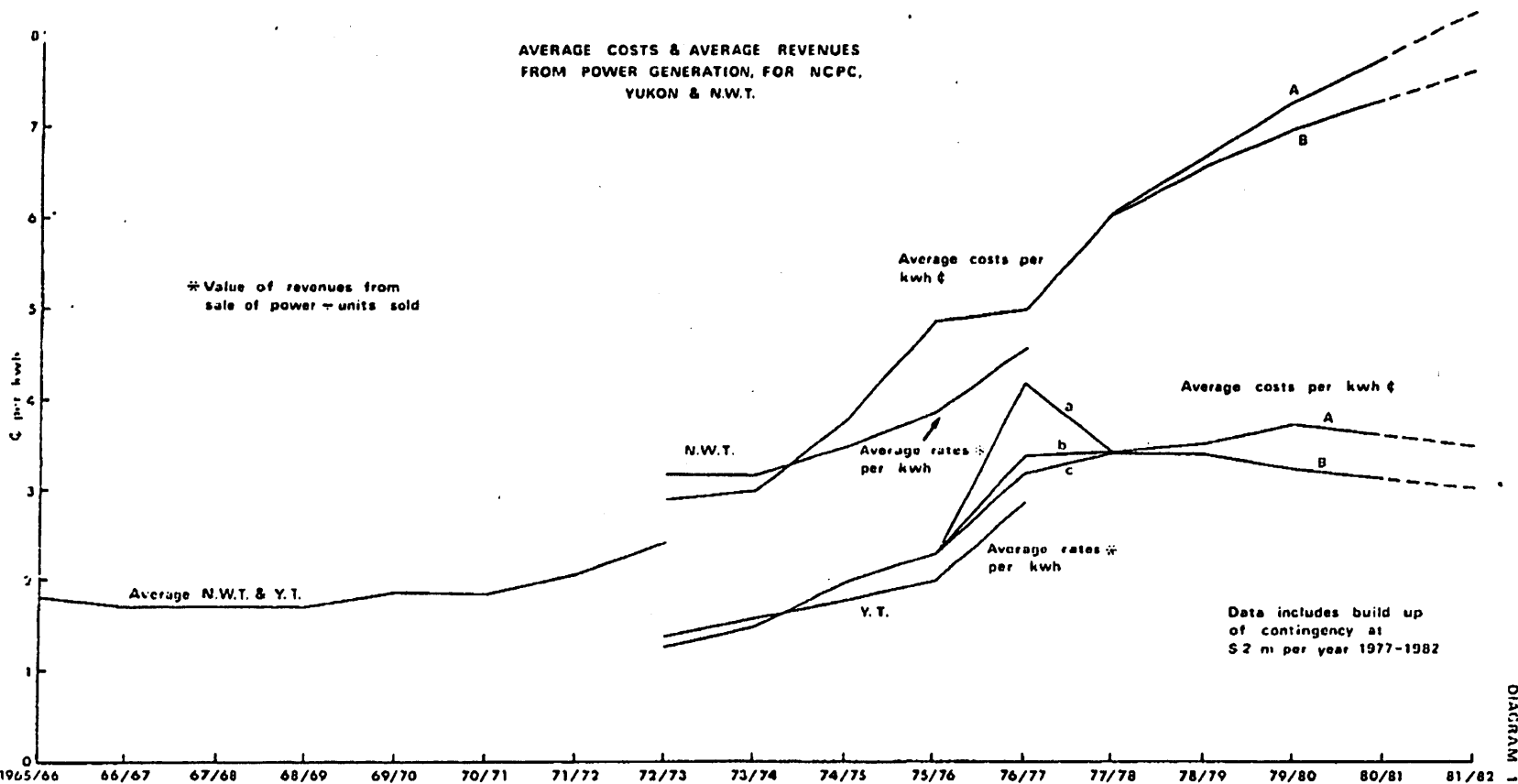
1. The Task Force be reconvened annually to re-examine the situation.



A.B. Ygles,
Chairman, Task Force on
Electrical Energy Costs in
the North.

November 15, 1976.

**AVERAGE COSTS & AVERAGE REVENUES
FROM POWER GENERATION, FOR NCPC,
YUKON & N.W.T.**



Note: Y.T. curve a: if Cyprus-Anvil strike lasts to March 31, 1977
 b: if strike ends October 1976
 c: situation without the strike

Projections: A: if no capital economies are possible
 B: with possible capital economies

Projections →

DIAGRAM 2

AVERAGE COST OF POWER, N.W.T.

Small Communities
(All communities in N.W.T.
excluding Hay River and
those served by Taltson
and Yellowknife)

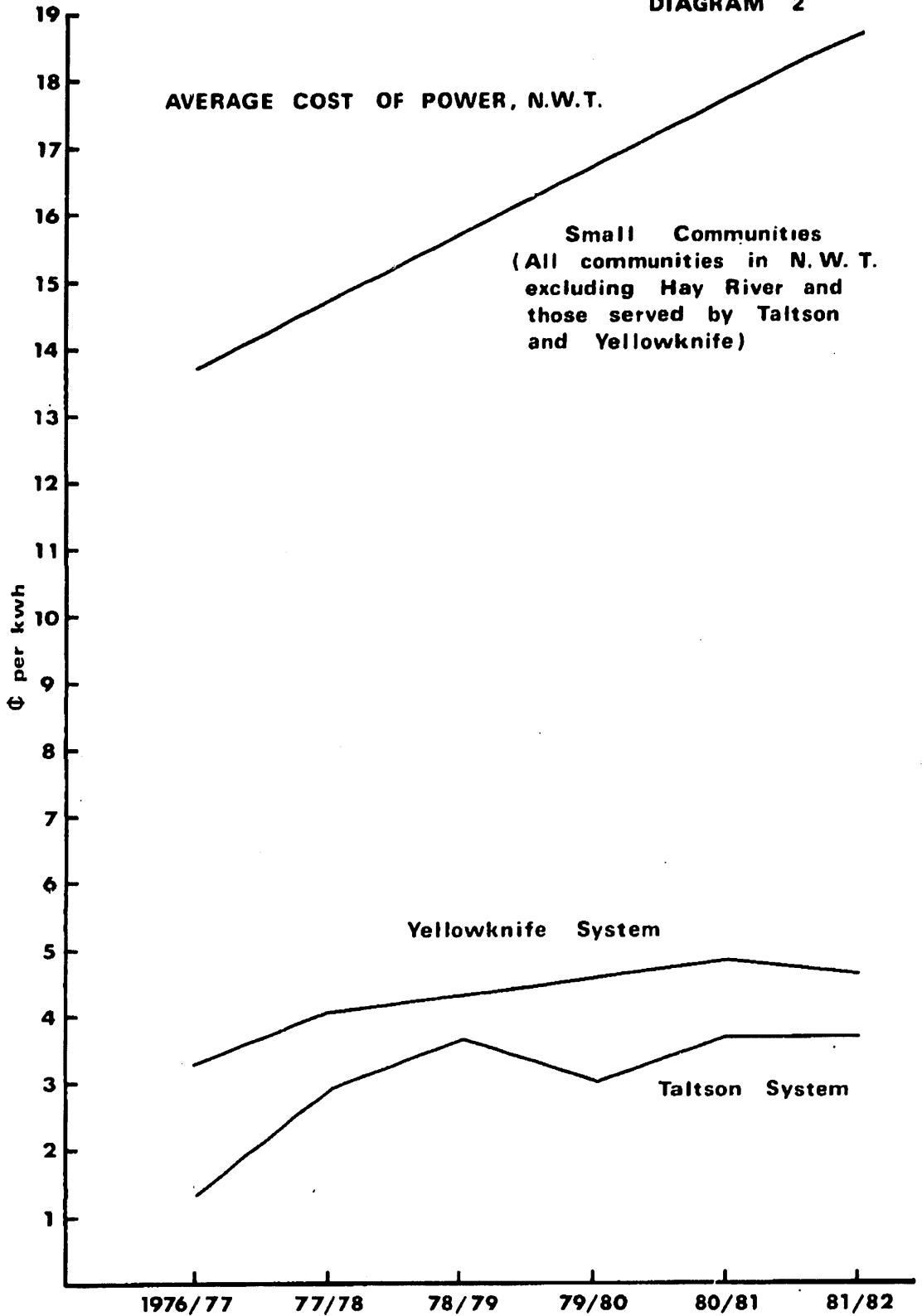


TABLE 1

Income/Expenditures, N.C.P.C.

Base Data

Yukon Territory

	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82
Sales Kwh mm	209	229.2	252.5	278.8	*	320.2	350.0	380.0	410.0	440.0
Sales of Power \$mm	3.0	3.6	4.6	5.6	*					
Other Income \$mm	0.3	0.1	-	0.2	0.1	0.2	0.2	0.3	0.4	n/a
Total Income \$mm	3.3	3.7	4.6	5.8	*					
Operating Costs \$mm	1.1	1.8	2.9	2.5	2.0	2.7	3.0	3.1	3.2	n/a
Debt/Interest Cost \$mm	1.7	1.6	1.8	3.7	6.6	7.7	7.8	8.2	8.5	n/a
Administrative \$mm	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	n/a
Total Cost \$mm	3.0	3.6	5.0	6.5	9.0	10.3	11.3	11.8	12.3	n/a
Net Income \$mm	0.3	0.1	-0.4	-0.7	*					
Cost of Power \$mm	2.7	3.5	5.0	6.3	8.9	10.1	11.1	11.5	11.9	n/a
Sales per kwh ¢	1.4	1.6	1.8	2.0	2.9					
Cost per kwh ¢	1.3	1.5	2.0	2.3	(3.4) (4.2) (3.2)	3.2	3.2	3.0	2.9	n/a

N.W.T.

	72/73	73/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82
Sales kwh mm	258	290.0	305.8	327.7	390.8	426.8	450.0	470.0	490.0	510.0
Sales of Power \$mm	8.2	9.2	10.6	12.8	18.1					
Other Income \$mm	2.0	1.5	2.6	2.9	2.9	3.8	3.8	3.9	4.0	n/a
Total Income \$mm	10.2	10.7	13.2	15.7	21.0					
Operating Cost \$mm	6.2	6.6	9.4	13.2	14.5	16.6	17.8	18.9	19.8	n/a
Debt/Interest Cost \$mm	2.6	2.8	3.6	4.5	6.3	10.1	12.3	14.0	15.7	n/a
Admin. Cost \$mm	0.7	0.8	1.2	1.4	1.7	2.0	2.4	2.8	3.0	n/a
Total Cost \$mm	9.5	10.3	14.2	19.1	22.5	28.7	32.5	35.7	38.5	n/a
Net Income \$mm	0.7	0.4	-1.0	-3.4	-1.5					
Cost of Power \$mm	7.5	8.8	11.6	16.2	19.6	24.9	28.7	31.8	34.5	n/a
Sales per kwh ¢	3.2	3.2	3.5	3.9	4.6					
Cost per kwh ¢	2.9	3.0	3.8	4.9	5.0	5.8	6.4	6.8	7.0	n/a

* See Attached Table "Impact of Anvil Strike".

TABLE 1 Continued

		<u>Rate Adjustment for Contingency Provision</u>				
Contingency Build Up -		\$2 m per year over 5 years				
		1977/78	1978/79	1979/80	1980/81	1981/82
<u>Yukon Territory</u>						
Contingency Provision		\$ 0.857mm	\$.875mm	\$.894mm	\$ 0.911mm	\$ 0.911mm
Average Cost of Power from Above		3.2¢	3.2¢	3.0¢	2.9¢	n/a
With Contingency Provision		3.42¢	3.42¢	3.26¢	3.12¢	n/a
<u>N.W.T.</u>						
Contingency Provision		\$ 1.143mm	\$ 1.125mm	\$ 1.106mm	\$ 1.089mm	\$ 1.089mm
Average Cost of Power from Above		5.8¢	6.4¢	6.8¢	7.0¢	n/a
With Contingency Provision		6.1¢	6.6¢	7.0¢	7.3¢	n/a

Explanatory Note

Data from 1972/73 to 1975/76 are actual. 1976/77 data are compiled by the Accounting Office of NCPC. Future years data are based on (a) extrapolation of operating costs, (b) predicted debt and interest cost given current capital requirements and future projected requirements (c) sales data from NCPC. Contingency provision is allocated to each territory on the basis of kwh sales. "Cost of Power" is less than total costs by the extent that NCPC has income from other sources.

TABLE 2

IMPACT OF ANVIL STRIKE ON
INCOME/EXPENDITURE NCPC
YUKON, 1976/77

Cost of Power Generation

Admin. Cost	\$ 0.4 mm
Debt/Interest	\$ 6.6 mm
Operating Cost	<u>\$ 2.0 mm</u>
Total	<u>\$ 9.0 mm</u>
Less, other projects	<u>\$ 0.1 mm</u>
Cost of power	<u>\$ 8.9 mm</u>

Average Cost
of Power

<u>Predicted Sales:</u>	if Anvil strike ends immediately	
	258.6 KWH mm	3.4¢
	Revenue <u>\$7.4 mm</u>	
	Loss <u>\$1.5 mm</u> to year end March 1977	
<u>Predicted Sales:</u>	if Anvil strike continues to year end,	
	210.6 KWH mm	4.2¢
	Revenue <u>\$6.1 mm</u>	
	Loss <u>\$2.8 mm</u>	
<u>Predicted Sales:</u>	if Anvil strike had not occurred,	
	282.0 KWH	3.2¢
	Revenue <u>\$8.0 mm</u>	
	Loss <u>\$0.9 mm</u>	

TABLE 3

N.W.T. Systems

Total Sales mm kwh

	<u>1976/77</u>	<u>1977/78</u>	<u>1981/82</u>
Total of Small Communities	95.5	103.4	138.2
Taltson System	128.3	163.6	204.4
Yellowknife System	<u>122.5</u>	<u>132.3</u>	<u>172.8</u>
Total	<u>346.3</u>	<u>409.3</u>	<u>515.4</u>

Total Costs

		\$ mm	
Total of Small Communities	13.06	15.33	25.88
Taltson	1.77	4.83	7.66
Yellowknife	<u>4.07</u>	<u>5.46</u>	<u>8.08</u>
	<u>18.90</u>	<u>25.62</u>	<u>41.62</u>

Cost Per kwh ¢

Total of Small Communities	13.7	14.8	18.7
Taltson	1.38	2.95	3.75
Yellowknife	3.32	4.13	4.67

Data taken from five year financial forecast, NCPC. These data are not fully compatible with Table 1.

APPENDIX I

ANALYSIS OF THE COST OF ELECTRIC POWER
TO NON - GOVERNMENT DOMESTIC CONSUMERS
IN THE NORTHWEST TERRITORIES AND THE YUKON TERRITORY

Resources Section
Northern Program
Planning Division.
October 5, 1976.

RESULTS OF ANALYSIS

a) Comparison of Cost of Power

The monthly cost of certain blocks of power in communities in the Territories was compared with the same type of data in other parts of Canada.

The comparison of residential rates is best understood by looking at the attached graphs (figs. 1 and 2) in which the cost of blocks of power in the northern communities is compared with Montreal, with the average of ten Canadian cities and with Charlottetown, P.E.I. As of summer, 1976, Montreal had one of the most favourable rates while Charlottetown had one of the highest rates.

Beginning with the May 1976 billing cycle NCPC has instituted a system whereby the first 300 kwh per month of power are subsidized so that they do not exceed 5 cents per kwh for the NCPC domestic non-government customer. In effect this is only significant for customers in the NWT. In the Yukon Territory, an equalization payment keeps the residential rate for the first 300 kwh per month to 2.5 cents per kwh in Whitehorse and 2 cents per kwh in the other communities. As a result, costs in the Yukon are held down relative to other areas in Canada for the initial blocks of power. On the other hand, it is common to bill consumers in the provincial hydro-systems at a higher rate or with a minimum charge for the first kwhs of consumption and to use lower rates thereafter.

The graph for the Yukon (fig. 1) shows that Whitehorse and communities served by NCPC with the exception of Dawson had costs below the 10-city average up to a consumption of 600 kwh per month. Thereafter, they are higher but still well below the Charlottetown cost. Dawson and the communities served by Yukon Electric other than Whitehorse have a considerably higher cost than Charlottetown once the consumption exceeds 600 kwh per month.

The graph for the N.W.T. (fig. 2) shows that the costs of power for Yellowknife, Pine Point, Fort Smith and Rae/Edzo are higher than average costs in ten Canadian cities but still below the cost in Charlottetown. The cost of power in all other N.W.T. communities is seen to be much above that of Charlottetown.

b) Changes in Electric Power Rates in Recent Years

Table I gives the cost of monthly blocks of power of 500 kwh and 1,000 kwh for several northern communities and for Charlottetown, Halifax and Montreal.

The Table shows that the northern communities listed had no rate changes or only rate reductions between 1965 and 1974. From 1974 to 1975 there were minor increases. However, the recent increases in electricity rates in 1976 relative to 1975 represent a sudden increase. It is especially steep throughout for a consumption of 1,000 kwh per month. For a power block of 500 kwh per month, only Yellowknife and Fort Simpson have a really large increase over one year.

Charlottetown and Halifax rates show a similar sudden increase in cost of power from 1975 to 1976, yet in absolute terms, the Halifax rates are still much lower. It may be noted that the Nova Scotia Power Corporation has asked for authority to introduce major new rate increases by December 1st, 1976. The Montreal figures show a gradual rise in domestic electricity costs over the years.

c) Future Energy Costs of NCPC

In August, NCPC provided a six year forecast of its energy costs for the different communities and the systems which it services. The comptroller of the company considers many of the figures as quite tentative and he insists that they are still being evaluated and considerable revisions may be expected. The figures given represent the average cost per kwh for the total load expected to be demanded in the given fiscal year. How the costs will be assigned to various classes of consumers is not indicated. It may be noted that in early October the comptroller advised that fully distributed cost studies are now in progress.

In regard to the very small communities serviced by NCPC in the N.W.T. and in the Y.T., increases in costs are anticipated throughout between the fiscal years 1976-77 and 1981-82. Individual increases vary considerably, however, in general, the range is between 20 per cent and 50 per cent over the five year period.

In early October revised figures were supplied for the three major electricity systems of NCPC.

Forecast of Energy Costs

(¢ per Kwh)

for NCPC Plants in Three Major Systems.

Fiscal Years:	1975/76 actual	1976/77 actual	1977/78	1978/79	1979/80	1980/81	1981/82
Taltson System	1.65	1.4	3.0	3.7	3.1	3.7	3.8
Yellowknife System	2.3	3.3	4.1	4.3	4.6	4.9	4.7
Whitehorse System	2.2	3.0	2.9	2.9	3.0	3.0	3.1

In looking at the above figures, it is evident that a cost increase of over 100 per cent is forecast for the Taltson system in the coming fiscal year. Pine Point and Fort Smith are the two largest communities supplied by this system. Much of the increased costs could be passed on to the major industrial consumer, Pine Point Mines. New diesel generating capacity is being installed to supply the mine with a greater amount of power.

In Yellowknife, electricity costs are expected to increase a further 24 per cent between April 1977 and April 1978. However, in subsequent years small increases are anticipated.

In regard to the Whitehorse system, it is evident that after the recent major increase in costs, future costs are expected to remain level over the next five years.

d) Comparison of Consumption

The graphs of figures 3 and 4 compare the average monthly consumption in the Territories with consumption in the Provinces. Graphs for 1975 as well as 1974 are given because the former uses extrapolated figures for the provincial consumption, while the 1974 graph represents the latest data of Statistics Canada.

The figures show that the average consumption of electricity by residence in the Territories is very high. The 1974 figure indicates that the consumption in the Territories is exceeded only by Manitoba, while the 1975 graph gives the Yukon Territory the position of top average consumer.

Great care must be taken in drawing conclusions when comparing consumption in one province with that of another. In a general way, a more extensive use of electric heating will lead to a larger total in consumption. In 1973, there were 9.8 per cent of consumers in Manitoba using electric heating, the highest average of any province. Compared to this, Alberta used no electric heat since oil and gas were the cheapest means of home heating and water heating. Cross hatching has been used to indicate those provinces and the Yukon Territory where more than 5 per cent of consumers have electric heating. In the other provinces, there were less than 1 per cent of billings for consumers with electric heating.

When one examines the residential consumption in various localities in the Territories, it is apparent that there is a considerable difference in the volume of consumption in certain larger communities relative to that of the remaining smaller communities (fig. 5 and 7). In the Yukon, the city of Whitehorse and the town of Faro together had an average consumption of 1,143 kwh per month in 1975. On the other hand 15 small communities had an average residential consumption of only 556 kwh per month.

In the Northwest Territories, Yellowknife, Inuvik and Pine Point together had an average residential consumption of 1,052 kwh per month in 1975. In comparison, the average consumption for 46 other communities was only 590 kwh per month.

The reasons for the different levels of consumption in specific towns compared to most smaller communities will be discussed in more detail later.

e) Comparison of Average Monthly Electricity Bill

Figures 5 and 7 illustrate the size of an average monthly residential electricity bill in the Territories and for comparison the size of the average monthly bill in P.E.I., Nova Scotia and Canada. The bars of the graph are located along an axis which shows the average monthly consumption for the corresponding bill. The bills are representative of mid-1976 rates (for Yellowknife November 1976) combined with consumption data for 1975.

For the Yukon Territory it is evident that the size of average monthly bills for small communities is not out of line with the averages of Canada and the Maritimes. Dawson City and ten small communities keep bills down by using a very moderate amount of electricity. Watson Lake and Mayo consume more on the average, however, in their case rates are low enough to keep the bills at a reasonable level. Whitehorse and Faro stand out as the two communities with a higher consumption and a considerably higher average bill. They surpass the average P.E.I. bill by 38 per cent and 57 per cent respectively.

The figure (fig. 7) illustrating the situation in the Northwest Territories is more striking than that of the Yukon in pronouncing the differences relative to P.E.I., Nova Scotia and Canadian averages. At the lowest end of consumption we have 24 small communities with an average monthly consumption of only 200 kwh per month. Next, there are 11 small communities which have an average consumption of 409 kwh per month and yet their bill is still much higher than the average Canadian bill with 677 kwh per month. The community that stands out in particular with a very high average bill is Fort Simpson. Its average level of consumption seems quite in line with the Canadian average but its rates are so high that the final bill is three times larger.

The three communities with a high consumption and a high electricity bill are Yellowknife, Inuvik and Pine Point. In the case of Yellowknife and Pine Point the rates for the average blocks of power indicated were still lower than those for P.E.I. However, with the higher consumption the average bill in Yellowknife was (or rather will be after November 1976) 67 per cent above the average monthly bill in P.E.I. The average bill in Pine Point was 86 per cent above that of P.E.I. The case of Inuvik is special and will be discussed later. It seems that domestic consumers there are prepared to pay a very high rate for a high average consumption.

As we consider these facts, we are faced with two questions: why the difference in amount of consumption between communities and why do certain communities have such a high average level of consumption? Our knowledge of detailed facts are limited, however, a number of points are known which allow some preliminary comments.

f) Reasons for Higher Electricity Consumption in the North

As a general statement it has been claimed by residents in Yellowknife and Whitehorse, that Northerners, because of their environment, have to use more electric power than Canadians living further south. Of course a comparison of individual needs

and uses is a very subjective matter and it is difficult to speak of norms. If we consider a middle income Canadian one might say that the following items would cause him to use a greater amount of electricity in the North than in the South.

- 1) Electrically Heated Water Tank: As a rule the water entering the tank will be at a lower temperature than in the South. This could require up to one quarter more electricity to bring the water to the same temperature (Statement by manager of Yukon Electric office in Whitehorse). The average annual consumption of electricity for a hot water heater is estimated at 4,000 kwh by the Department of Energy, Mines and Resources.
 - 2) Car Engine Block Heater, Battery Warmer and Interior Pre-Heater: For a car plugged in 12 hours for 30 days this could mean the consumption of 460 to 600 kwh.
 - 3) Oil Burner and Furnace Blower: A furnace is likely to run more frequently in a colder climate and thus the burner and blower could consume a higher amount of electricity than in the south.
 - 4) Lighting: If one is dealing with a moderate use of lighting this item, compared to a moderate use in Southern Canada with fewer hours of lighting in winter but more in summer, should not result in a major cost differential for a bill including charges for all other appliances.
 - 5) Electric Heating: Where consumers choose to use electricity for heating their consumption will be markedly greater than if they were to heat their home by some other means. Hydro Quebec estimates that a well insulated bungalow of 1,000 square feet in Quebec would use 24,000 kwh per year on an average while a 1,200 square foot bungalow would use an average of 28,800 kwh per year. In a study* prepared for DIAND, it is calculated that a 1,000 square foot house in Fort McPherson which uses 1,700 gallons of fuel oil for heating would require 49,000 kwh per year if electric heating were to be used.
- g) Discussion of Consumption and Size of Electricity Bills in Certain Communities

In an analysis of the situation it would be most useful to know the distribution of consumption, that is the number of consumers using specific amounts of electricity. Requests have been made to obtain distribution figures for Yellowknife and Whitehorse. However, at the time of writing the data are not available. Even without distribution data, other specific information will be discussed for a better understanding of the reasons behind the consumption pattern of certain communities.

Whitehorse - This community accounts for 73 per cent of billings in the Yukon Territory. At the end of December there were 4,076 residential consumers in Whitehorse and the average consumption by residential consumers was 1,137 kwh per month

* Underwood, McLelland and Associates, May 1974.

for the year 1975.

Most Federal Government employees live in government houses for which they pay rent. They are either charged a flat rate for electricity consumption on top of the rent or the rent includes the use of electricity. It may be noted that government-owned homes are all oil heated. Moreover, it is our information that timers have been installed with the electrical outlets for block heater plug-ins.

In 1975, the Department of Public Works paid for 305 residential accounts, an amount which would be equivalent to 1,074 kwh per month in that year. Given this information, we now have the following situation:

Average Monthly Consumption

All domestic consumers	1,137.4	kwh
Government domestic consumers	1,074	kwh
Domestic consumers excluding government employees	1,142	kwh

It is remarkable that the government domestic consumers who pay a flat rate and have no financial advantage in conserving energy would show a lower average consumption than the non-government domestic consumers. The explanation seems to be the use of electric heating in a large percentage of homes. In August 1976, the Yukon Electric Company knew of 577 houses and multiple dwellings which had electric heating. The Company believes that another 50 might have installed electric heating without advising them. This would represent about 15 per cent of consumers with electric heating if we relate the above figures to the year-end number of consumers for December, 1975. In fact, many of the houses with electric heating that we have included in the above figures were only constructed in 1976. Thus, the percentage at the end of 1975 would have been lower and it is to be expected that by the end of 1976 the average consumption for non-government domestic consumers will have risen markedly because of the larger proportion of electrically heated homes. In any case, it is evident that consumers using electric heating in their homes represent the most significant factor in bringing the overall average consumption figure for Whitehorse for non-government consumers to 1,142 kwh in 1975. It is also evident that consumers with electric heating would be very markedly affected by increases in electricity rates.

Yellowknife - Yellowknife accounts for 47 per cent of all billings in the Northwest Territories. At the end of 1975, there were 2,620 residential billings and the average bill for the year was 1,001 kwh per month.

As in Whitehorse, the Federal Government employee in Yellowknife commonly lives in a government house and pays rent which includes a flat charge for electricity. In December, 1975, the Department of Public Works paid for 449 government residential billings. The average consumption for these billings in the month of December was 1,290 kwh. In the same month non-government residential billings averaged 1,110 kwh or 14 per cent less. It should be noted that in Yellowknife only four residences are reported to be using electric heating.

Yellowknife has many apartments and it is reported that in most cases these are metered as residential billings. However, many of the other services such as the laundry facilities, the burner and fan for the furnace, the hall lights, the car plug-ins, etc., are metered as commercial on one meter for the whole building. In consequence, the consumption per apartment may be as low as 100 kwh per month. Such billings for apartments would tend to depress the overall average figure for Yellowknife.

Faro - This community has the highest consumption among communities in the Yukon Territory. In 1975, the average bill was 1,215 kwh per month. At the end of 1975, there were 311 billings for Faro. This is a modern community with many good-sized houses. It was built to service the largest mine in the Yukon Territory, the Cyprus Anvil Mine. Staff and employees of the mine represent a high proportion of the inhabitants of the town. There are few, or no Federal Government employees. Members of the mine staff are probably paying rent for company houses and the rent would include a flat charge for electricity. As to the wage earners, some of the mine unions have a contract which provides for a sharing of costs with the Company.

Pine Point - It is interesting to note that this mining community shows a similarity to Faro in its consumption which averages 1,304 kwh per month in 1975. The electricity rate in Pine Point is only slightly higher than in Faro. Here again, one is dealing with a mining community and there are few or no federal civil servants.

Fort Simpson - There have been some very vocal protests from this community following recent steep rate increases. Figure 7 and 8 show that the average consumption in Fort Simpson was about 645 kwh per month in 1975. In spite of this relatively moderate consumption the bills would be very high with a rate at this consumption of 9.06 cents per kwh.

In September of this year the chairman and the comptroller of NCPC went to Fort Simpson to investigate the situation. They were able to establish the following facts. In May 1976, there were 193 non-government domestic consumers. Out of these, 120 consumed less than 390 kwh per month in 1975. Their bills would be lower after May 1976, than they had been before. This could be attributed to the subsidized rate of 5 cents per kwh for the first 300 kwh per month. This left 73 consumers which required more than 390 kwh per month and whose bill would show a considerable rise after May 1976. However, 23 of these billings were paid by the consumers' employer. This left 50 consumers which found themselves saddled with much higher bills than they had been used to paying before May 1976.

Inuvik - In figure 7 Inuvik is shown as the community paying the highest average bill in the North, \$82.44 for an average monthly consumption of 1,143 kwh. The striking feature about Inuvik is that there are only 377 non-government domestic billings while the population listed in 1974 is 4,150. Obviously there would be a fair number of Federal employees whose billings would be grouped as government domestic. However, the most important factor appears to be the Northern Housing Programme. Under this, the Government has built accommodations which it rents to natives at a moderate price. Included in the rent is the use of electricity. Thus, the 377 billings would be other residential consumers. It is likely that many of these have their bills paid for them by their employers, be they companies engaged in oil and gas exploration or companies supplying these activities. If there are some hardship cases among these consumers, it is not possible to identify them since the average figures mask their existence.

Inuit Communities in the N.W.T. - Looking at figures for these communities, one is faced with the same question as in the case of Inuvik. Who are the non-government domestic consumers? In general, they are few in number compared to the population of the community. Thus, in Frobisher Bay there are 88 non-government domestic consumers in a population of 2,360; in Coppermine there are 5 consumers in a population of 727; in Cambridge Bay there are 7 consumers in a population of 809 and so on for the Inuit settlements of the Arctic. In the majority of cases, the few consumers listed have a low average consumption. These residual consumers do not seem to represent people that can afford high bills. Perhaps they are natives that have chosen not to avail themselves of the Northern Housing Programme. And then again, the billings could be for the consumers which live in the community for only a limited number of months of a year.

SUMMARY

In certain communities in the Northwest Territories and in the Yukon Territory, the average monthly domestic consumption of electricity exceeds the provincial average of Canada to a considerable extent. However, within the Territories there are other communities with an average consumption below the Canadian provincial average.

Recent raises in electricity rates have most seriously affected Territorial residents who were used to a high level of consumption of power, that is, to a consumption above 1,000 kwh per month. They were especially hard hit in Whitehorse if they were using electric heating since this could raise average monthly consumption by 2,000 to 4,000 kwh.

Equalization payments in the Yukon reduce costs for the consumption of the first 300 kwh per month, so that costs exceed the average of ten Canadian cities only at about 360 kwh per month. For Whitehorse, the electricity cost would exceed the average cost of ten Canadian cities at about 670 kwh per month (see fig. 1). In the Northwest Territories, a consumer in all locations except Hay River would still be paying less than a consumer in Charlottetown until he passed a consumption of about 330 kwh per month (see fig. 2). Consumers in the Territories using a small amount of electricity were adversely affected only in those localities which had previously benefited from very low power rates over recent years. This could be the case in a number of communities, for example, Yellowknife. However, it is not known how many consumers were affected in this way.

The middle income resident living north of 60 degrees could make a case that he needs somewhat more electricity than he would if he were living further south. Also he could show that in using this extra electricity he is now paying a higher bill than he might have paid in the south. Yet, if one were to establish minimum standards of living with reference to low income Canadians, it is evident that the demands of this kind of consumer would be well above any such standards.

TABLE 1

NON-GOVERNMENT DOMESTIC MONTHLY BILLS FOR SELECTED BLOCK OF POWER

			1965	1968	1970	1972	1973	1974	1975	1976	AVERAGE ANNUAL GROWTH RATE 1970 - 1976
Whitehorse	500	KWH	21.45	24.00	* 13.50	* 13.30	* 10.30	* 10.30	* 10.74	* 12.90	- 0.51
	1000	KWH	36.45	44.00	28.50	21.30	17.30	17.30	18.84	26.40	- 1.27
Yellowknife	500	KWH	10.30	10.30	10.30	10.30	10.30	10.30	12.03 ***	21.90	13.40
	1000	KWH	18.80	18.80	18.80	18.80	18.80	18.80	22.18	41.90	14.29
Fort Simpson	500	KWH	28.45	28.45	28.45	28.45	28.45	28.45	30.91	37.00	4.48
	1000	KWH	53.45	53.45	53.45	53.45	53.45	53.45	58.41	92.00	9.47
Faro	500	KWH	12.90	12.90	12.90	12.90	12.90	* 13.30	* 13.90	* 13.10	0.26
	1000	KWH	22.90	22.90	22.90	22.90	22.90	23.30	24.20	30.85	5.09
Inuvik	500	KWH	25.16	25.16	25.16	25.16	25.16	25.16	27.61	31.00	3.54
	1000	KWH	47.66	47.66	47.66	47.66	47.66	47.66	52.61	71.00	6.87
Fort Smith	500	KWH	25.81	** 15.26	** 15.26	13.80	13.80	13.80	13.80	15.50	0.26
	1000	KWH	48.40	30.26	30.26	23.80	23.80	23.80	23.80	28.00	- 8.72
Charlottetown	500	KWH	11.90	11.90	11.90	12.85	14.15	14.15	15.59	24.79	13.01
	1000	KWH	19.40	19.40	19.40	20.70	22.90	22.90	25.24	42.24	13.85
Halifax	500	KWH	10.10	10.10	10.10	10.10	10.10	10.10	10.10	15.62	7.54
	1000	KWH	16.10	16.10	16.10	16.10	16.10	16.10	16.10	27.24	9.16
Montreal	500	KWH	6.06	7.56	8.20	8.20	9.10	9.10	9.95	10.60	4.37
	1000	KWH	10.30	12.42	13.20	13.20	14.60	14.60	16.20	17.60	4.91

* Credit given for Yukon Government Rebate

** Bill subsidized

*** Proposed November, 1976

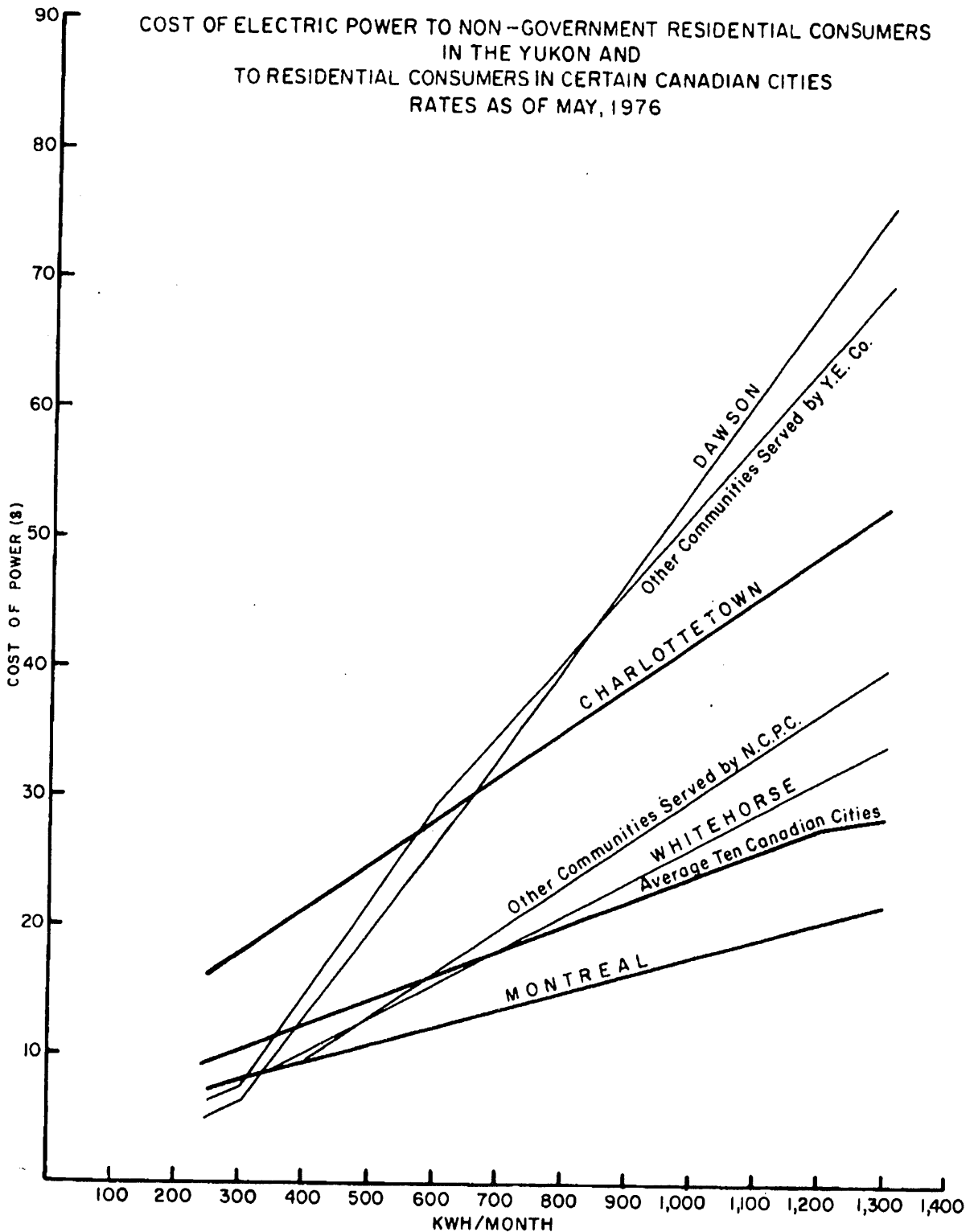
Source - Northern Communities: N.C.P.C. August, 1976.

Canadian Cities:

"Electricity Bills for Domestic, Commercial and Small Power Service"
Statistics Canada, Catalogue No. 57-203 Annual.

FIGURE I

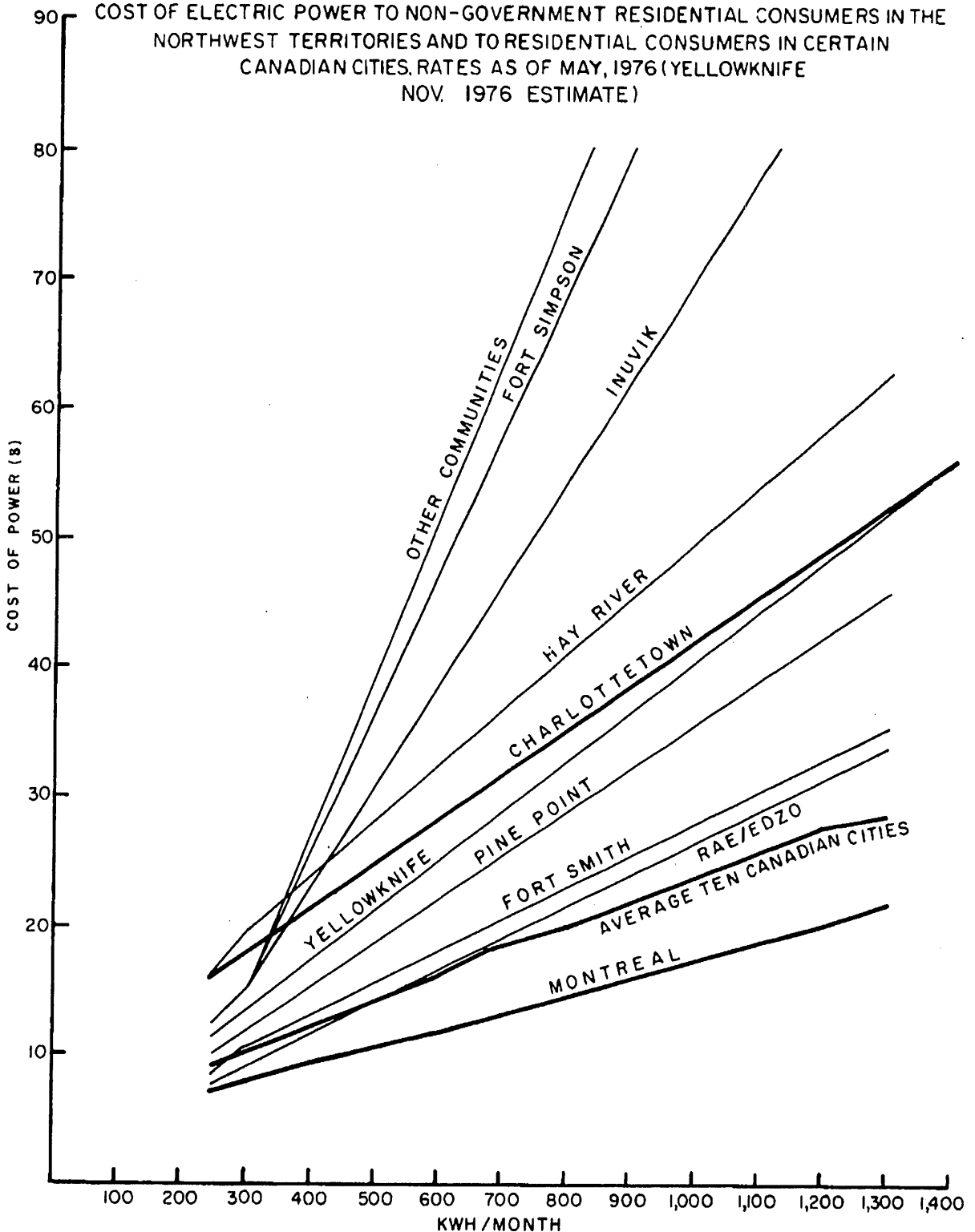
COST OF ELECTRIC POWER TO NON-GOVERNMENT RESIDENTIAL CONSUMERS
IN THE YUKON AND
TO RESIDENTIAL CONSUMERS IN CERTAIN CANADIAN CITIES
RATES AS OF MAY, 1976



SOURCES: N.C.P.C. DATA RE: YUKON COMMUNITIES
ENERGY POLICY SECTOR, E.M.R. FOR OTHER DATA

FIGURE 2

COST OF ELECTRIC POWER TO NON-GOVERNMENT RESIDENTIAL CONSUMERS IN THE NORTHWEST TERRITORIES AND TO RESIDENTIAL CONSUMERS IN CERTAIN CANADIAN CITIES. RATES AS OF MAY, 1976 (YELLOWKNIFE NOV. 1976 ESTIMATE)

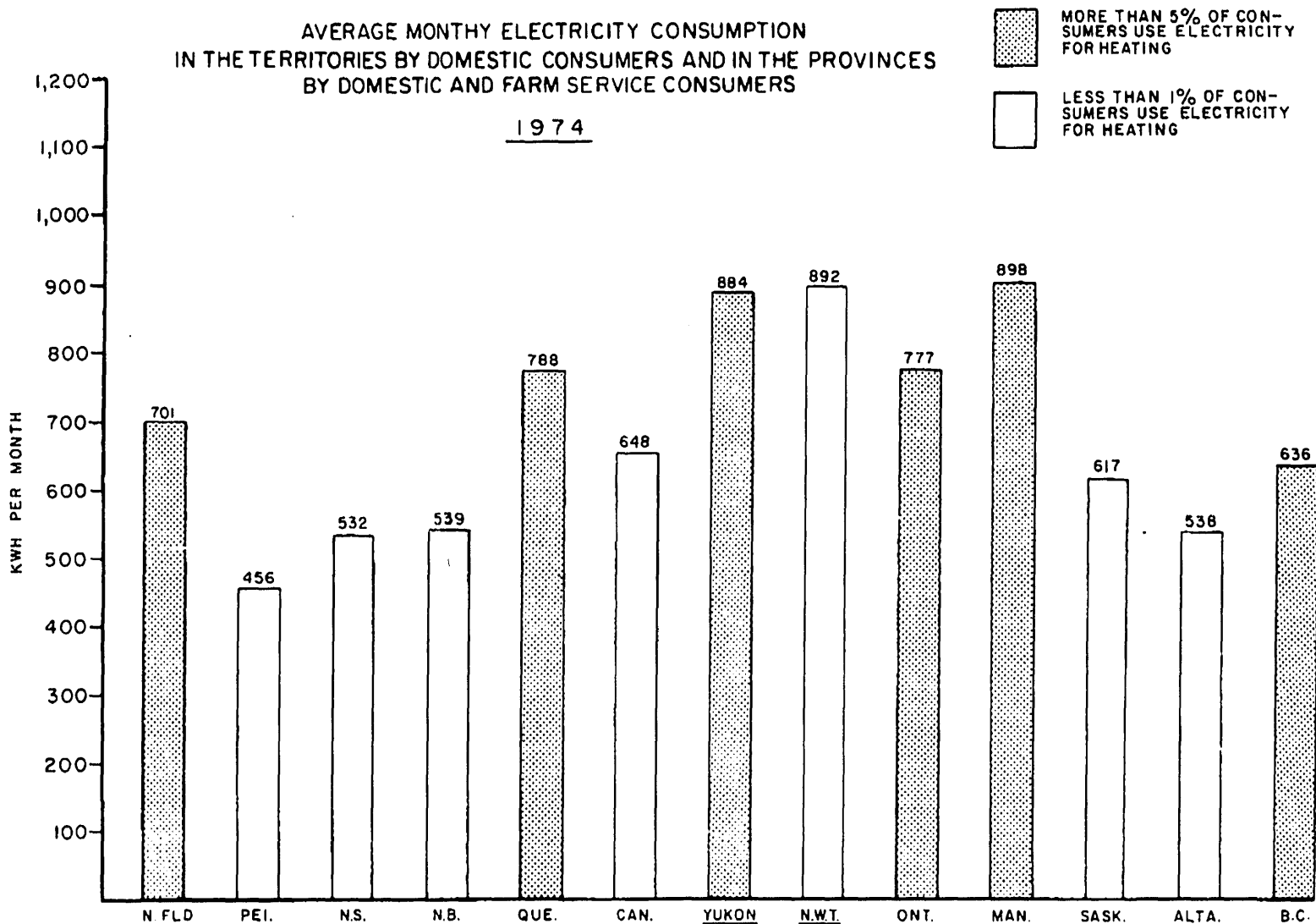


SOURCES: N.C.P.C. DATA RE: N.W.T. COMMUNITIES
ENERGY POLICY SECTOR, E.M.R. FOR OTHER DATA

FIGURE 3

AVERAGE MONTHLY ELECTRICITY CONSUMPTION
IN THE TERRITORIES BY DOMESTIC CONSUMERS AND IN THE PROVINCES
BY DOMESTIC AND FARM SERVICE CONSUMERS

1974

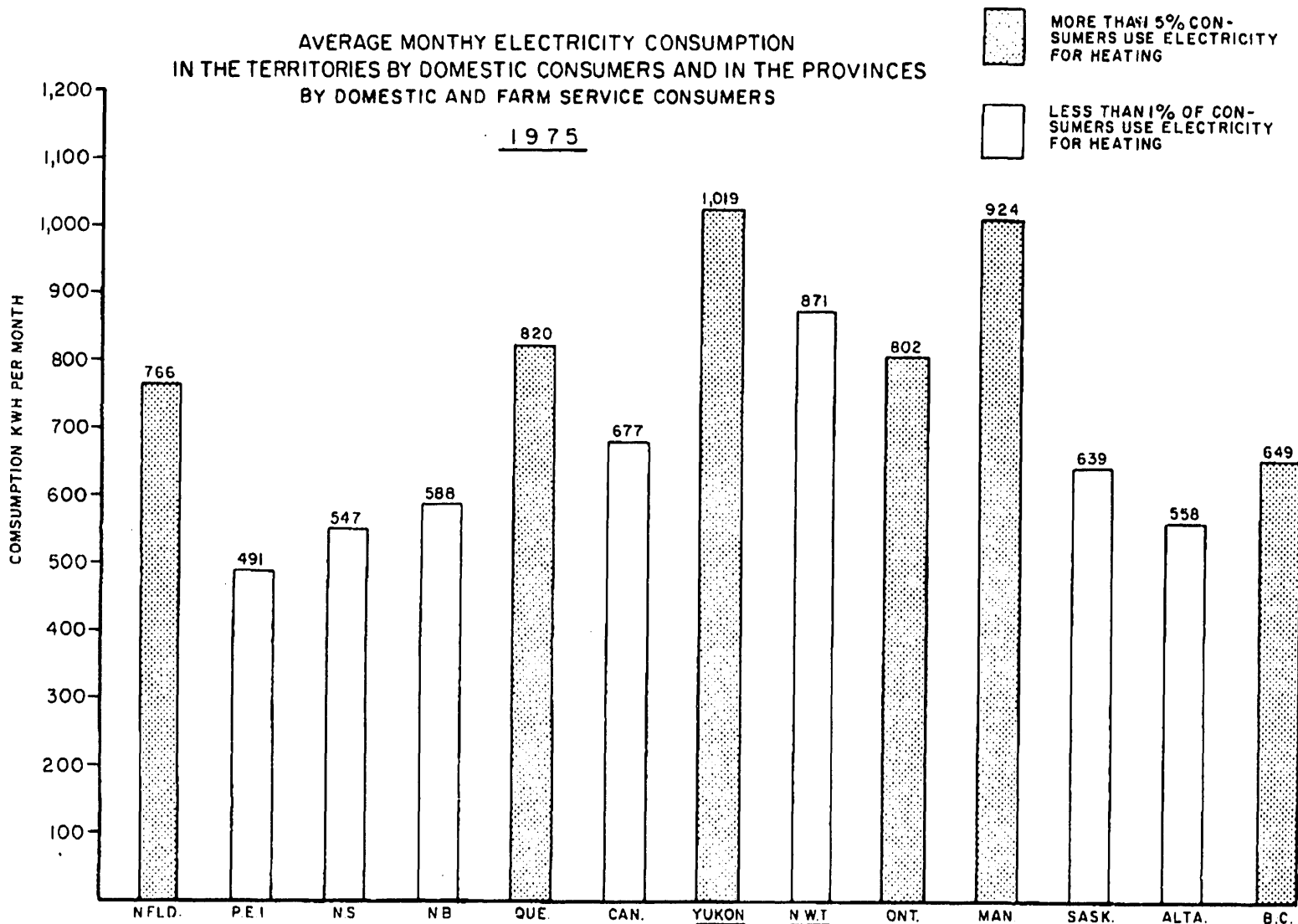


SOURCE: STATISTICS CANADA

FIGURE 4

AVERAGE MONTHLY ELECTRICITY CONSUMPTION
IN THE TERRITORIES BY DOMESTIC CONSUMERS AND IN THE PROVINCES
BY DOMESTIC AND FARM SERVICE CONSUMERS

1975



SOURCE: N.C.P.C. FOR YUKON TERRITORY AND NORTHWEST TERRITORIES - OTHER FIGURES ESTIMATED

FIGURE 5

AVERAGE MONTHLY ELECTRICITY BILLS OF SELECTED COMMUNITIES IN THE YUKON COMPARED TO P.E.I., N.S. AND CANADIAN AVERAGE.

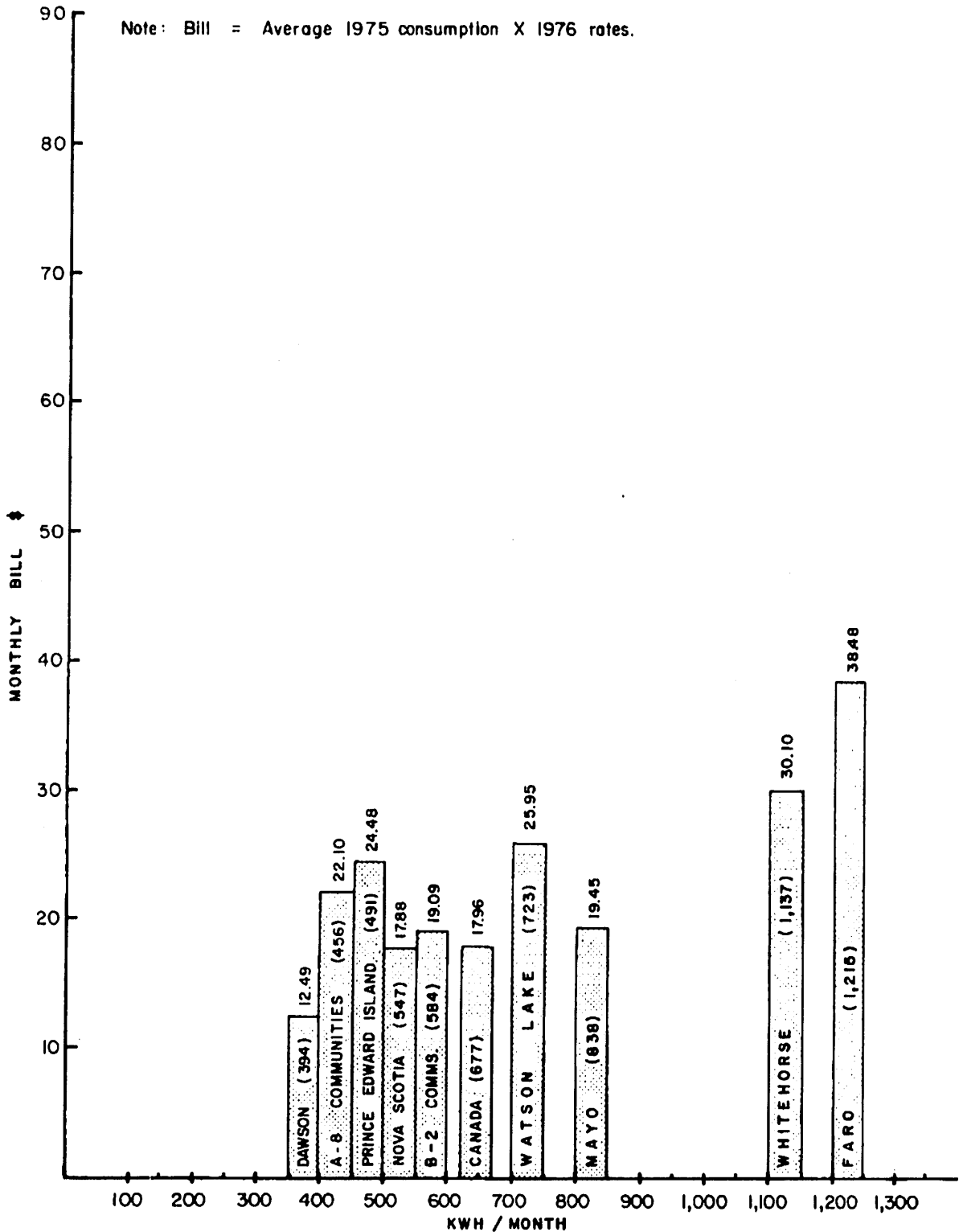


FIGURE 6

AVERAGE COST PER KWH
FOR SELECTED COMMUNITIES IN THE YUKON
COMPARED TO P.E.I., N.S. AND CANADIAN AVERAGE

1 9 7 6

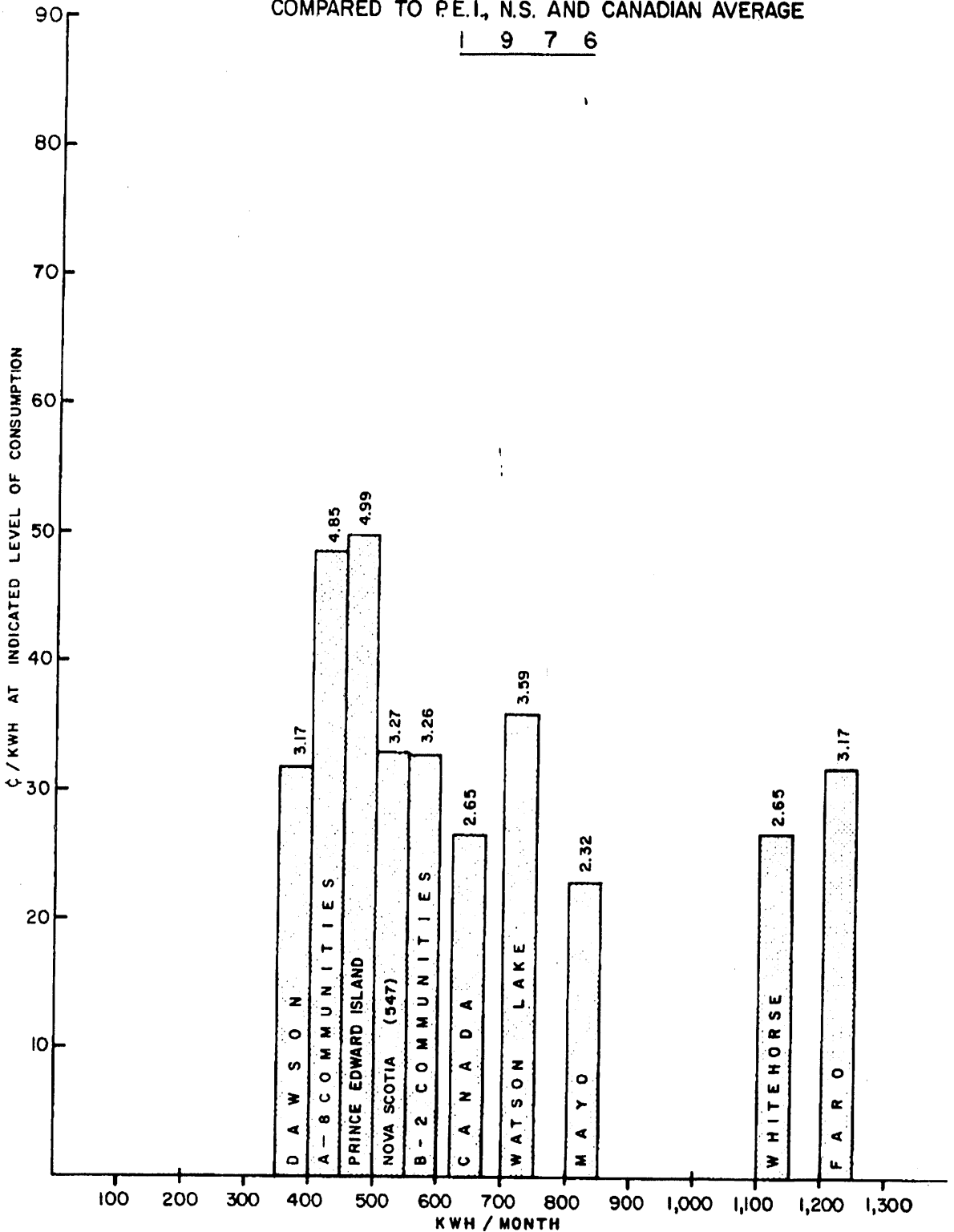


FIGURE 7

AVERAGE MONTHLY ELECTRICITY BILLS OF SELECTED COMMUNITIES IN THE N.W.T COMPARED TO P.E.I., N.S. AND CANADIAN AVERAGE.

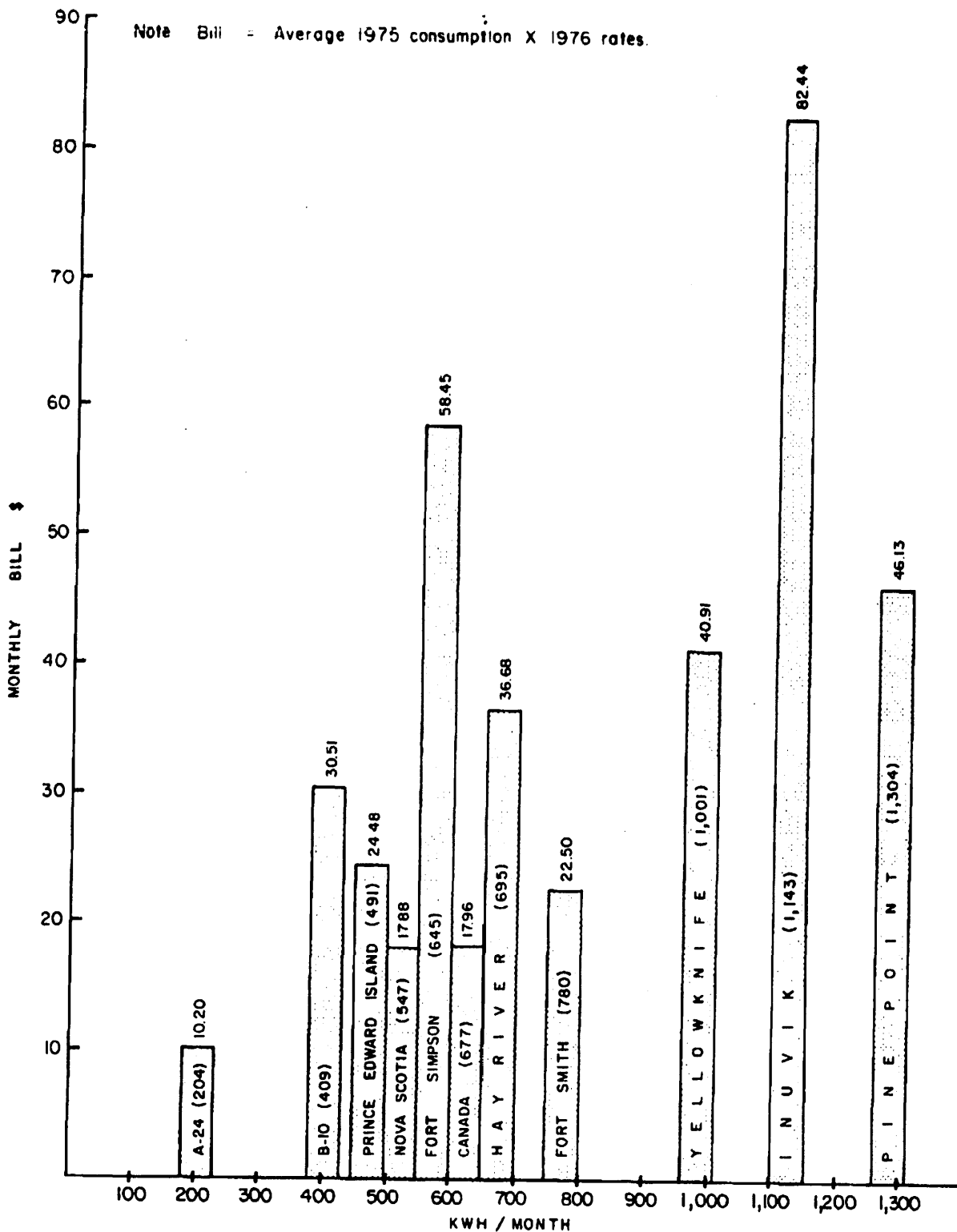
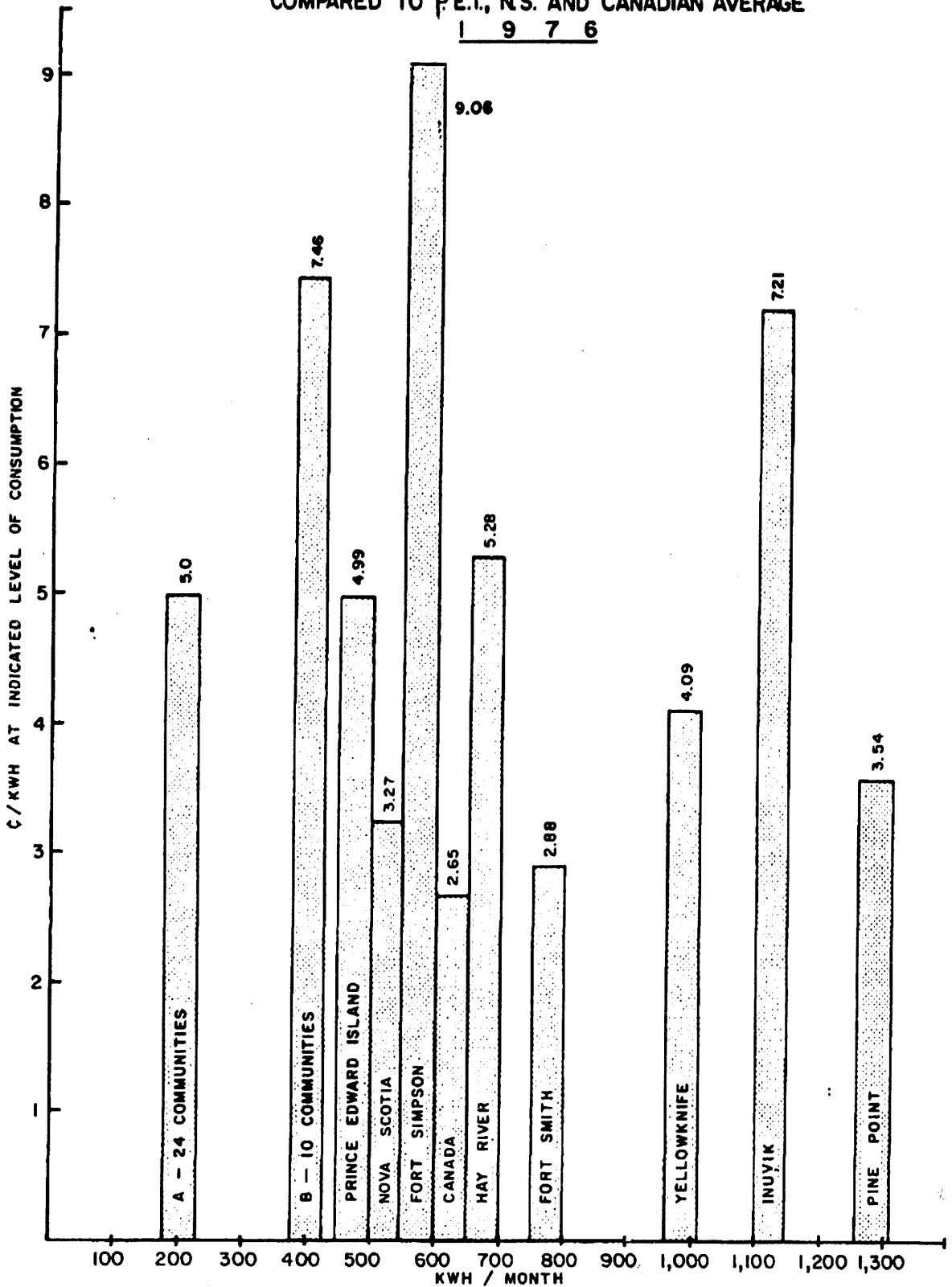


FIGURE 8

AVERAGE COST PER KWH
FOR SELECTED COMMUNITIES IN THE N.W.T.
COMPARED TO P.E.I., N.S. AND CANADIAN AVERAGE

1 9 7 6



LIST OF COMMUNITIES INCLUDED UNDER "A" AND "B" IN FIGURES 5-8

YUKON TERRITORY - FIGURES 5 AND 6

- (A) Old Crow, Upper Liard, Pelly Crossing, Ross River, Stewart Crossing
Teslin Beaver Creek, Destruction Bay.
- (B) Carmacks and Carcross

NORTHWEST TERRITORIES 7 AND 8

- (A) Arctic Red River, Broughton Island, Chesterfield Inlet, Coral
Harbour, Fort Franklin, Fort Good Hope, Fort Liard, Fort
McPherson, Fort Norman, Fort Resolution, Grise Fiord, Hall
Beach, Holman Island, Jean-Marie River, Lac La Martre, Lake
Harbour, Nahanni Butte, Paulatuk, Sachs Harbour, Snowdrift,
Spence Bay, Whale Cove, Wrigley.
- (B) Cape Dorset, Eskimo Point, Igloolik, Pangnirtung, Baker Lake,
Coppermine, Gjoa Haven, Pelly River, Pond Inlet, Tuktoyaktuk.

TEN CANADIAN CITIES FOR WHICH AVERAGE RATES WERE AVAILABLE AS A GROUP.

St. John's	Toronto
Charlottetown	Winnipeg
Halifax	Regina
Fredericton	Calgary
Montreal	Vancouver